

28. \*Chalk (karee muttee) .. ... 1 chittack.  
 Chiretta or gentian .. ... ½ "  
 Ginger (soot) .. ... ½ tolah.  
 Opium .. ... ¼ "
- To be given twice a day in mucilage starch water, &c.
29. \*Powdered galls (majuphul) .. ... 1½ tolahs.  
 Chalk (karee muttee) .. ... ½ chittack.  
 Chiretta or gentian .. ... ½ "
- To be given in diarrhœa once or twice a day.
30. \*Catechu (khoyre) .. ... 1 tolah.  
 Opium (afeem) .. ... ¼ "
- In rice or linseed gruel two or three times a day.  
 In diarrhœa.
31. \*Lime water (chuner jol) .. ... 4 chittacks.  
 Milk (dudh) .. ... 1 seer.
- To be given three times a day in diarrhœa.
32. \*Chalk (karee muttee) .. ... 1 chittack.  
 Catechu (khoyre) .. ... ½ "  
 Ginger (soot) .. ... 1½ tolahs.  
 Opium (afeem) .. ... ¼ tolah.  
 Carraway (jeera) .. ... ½ "  
 Water .. ... 1 seer.
- Two to four cutchas in diarrhœa or dysentery, morning and night.
33. \*Galls (majuphul) .. ... ¼ tolah.  
 Catechu (khoyre) .. ... ½ "  
 Chalk (karee muttee) .. ... 1 chittack.
- In dysentery or diarrhœa twice a day.
- VI.—Medicines which inflame and blister the skin (blisters).
34. Oil of turpentine (tarpen tel) .. ... 1 chittack.  
 Liquid ammonia .. ... 1 "  
 Coconut oil (narkul er tel) .. ... 1 "  
 Mix and apply by rubbing.
35. \*Croton seeds (joipal er beech) .. ... ½ chittack.  
 Oil of turpentine (tarpen tel) .. ... 6 chittacks or 4 chittacks.  
 If wanted strong allow this to stand for a fortnight and then pour off  
 the clear fluid, which is to be mixed with an equal quantity of coconut  
 oil and rubbed to the part.
36. Liquid ammonia .. ... 1 chittack.  
 Mustard (rai) .. ... 1 "  
 Oil of turpentine .. ... 1 "
- To be rubbed to the skin after the hairs have been removed.
37. Tartar emetic .. ... ½ tolah.  
 Wax (mom) .. ... ¼ chittack.  
 Coconut oil (narkul er tel) .. ... ¼ "
- Mix the wax and oil together and add the tartar emetic.  
 To be rubbed to the skin.
38. Cantharides .. ... 1 chittack.  
 Oil of turpentine (tarpen tel) .. ... 8 chittacks.
- Mix, an excellent blister.
- VII.—Medicines which relieve distension of the bowels with wind (carminatives).
39. \*Mustard powder (rai) .. ... 2 chittacks.  
 Water (jol) .. ... ½ seer.
- Given in distension of the stomach with wind.
40. Aromatic spirit of ammonia .. ... 1 chittack.  
 Carbonate of ammonia .. ... ½ "  
 Cold water .. ... ½ seer.
- Given in similar cases.
41. Powdered gentian .. ... 1½ tolah.  
 Ditto ginger (soot) .. ... 1½ tolah.  
 Linseed meal (mooshiner boossie) .. ... 1 chittack.
- Given twice a day in 1 seer of beer or rice water.  
 In chronic flatulent distension.
42. Chiretta or gentian .. ... 1½ tolahs.  
 Ginger (soot) .. ... ¼ tolah.  
 Carraway (jeera) .. ... ½ chittack.
- Given twice a day in water or beer.

VIII.—Medicines which burn and destroy the soft textures of the body (caustics).

43. Nitrate of silver applied in substance.  
 44. Nitrate of silver ... 20 ruttees.  
 Water ... 1 chittack.

Applied to inflamed surfaces.

45. Nitric acid (shora er drapoo) or sulphuric acid (gundruck er drapoc.)  
 Applied with cotton to surfaces which it is wished to destroy.

46. White arsenic. (shenko beesh.)

Applied as a powder alone or mixed with an equal part of flour (soogee) to sloughing ulcers.

47. \*Corrosive sublimate (rosh karpoor) ...  $\frac{1}{2}$  chittack.  
 Flour (soogee) ... 1

Applied to parts which it is wished to destroy.

48. A piece of iron at a red heat acts well in absence of other caustics.

IX.—Medicines which soothe irritated and inflamed parts (demulcents).

49. Gum (bablar atta) ... 4 chittacks.  
 Water ... 1 seer.

A good vehicle for other medicines.

50. Boiled rice ... }  
 Suttoo ... }  
 Arrow root ... } water 1 seer.  
 Linseed meal ... }  
 Rice boossie ... }  
 Barley (jawb) ... }

Any of these substances can be prepared for a drink or drench, easily swallowed and soothing to the mucous membranes, and form admirable means for administering medicines.

X.—Medicines which promote the action of the skin (diaphoretics).

51. Nitric ether ...  $\frac{1}{2}$  chittack.  
 Nitre (shora) ... 2 tolahs.  
 Liquor acetatis ammonia ... 2 chittacks.

To be given every four hours in some gruel in fevers and colds.

52. \*Black antimony (soorma) ...  $\frac{1}{2}$  tolah.  
 Nitre (shora) ... 1 "  
 Black salt (karee lobun) ...  $\frac{1}{2}$  chittacks.

To be given in one seer of some gruel two or three times a day in fevers.

XI.—Medicines which increase the secretion of urine (diuretics).

53. Sweet spirit of nitre ... 1 chittack.  
 Solution of acetate of ammonia... 3 chittacks.

To be given in one seer of warm water or beer twice or thrice a day.

54. Nitrate of Potash (shora) ...  $1\frac{1}{2}$  Tolah.  
 Water. ...  $\frac{1}{2}$  seer.

To be given once or twice a day.

- \*55. Powdered resin (dhuna) ...  $1\frac{1}{2}$  chittacks.  
 Nitre (shora) ...  $1\frac{1}{2}$  "

In warm rice or linseed gruel daily.

56. Sweet spirit of nitre ...  $\frac{1}{2}$  chittack.  
 Oil of turpentine ...  $\frac{1}{2}$  "

To be given once or twice a day in a large quantity of rice or linseed gruel.

XII.—Medicines which are applied externally to painful and swollen parts (embrocations or liniments).

59. Oil of turpentine (tarpen tel) ...  $\frac{1}{2}$  chittack.  
 Coconut oil (narkul er tel)... 4 chittacks.  
 Liquid Ammonia ...  $\frac{1}{2}$  chittack.

Mix and rub to sprains and swellings.

58. Linseed oil (moshiner tel) ...  $\frac{1}{2}$  seer.  
 Oil of turpentine (tarpen tel) ... 2 chittacks.

Mix and add one and a half cutcha of sulphuric acid (gundruck er drapoc).

To be rubbed to swollen parts, useful in chronic rheumatism.

XIII.—Medicines which assist in getting rid of morbid discharges from the lungs.

59. (Expectorants) Sweet spirit of nitre ... 2 chittacks.  
 Powdered opium (afeem)...  $\frac{1}{2}$  tolah.  
 Tincture of aconite (kat beesh er orisht) ... 40 phuttas.

Half chittack of this to be given twice a day in rice water or mucilage till the cough is relieved.

**XIV.—Medicines which diminish febrile action. (Febrifuges.)**

60. *Nitre (shora)	...	2 tolahs.
Water	...	$\frac{1}{2}$ seer.
In slight fevers once or twice a day.		
Tincture of aconite.		
Aconite (kat beesh)	...	1 chittack.
61. Spirit	...	$\frac{1}{2}$ seer.
15 to 30 phuttas for a dose.		
62. Powdered digitalis	...	15 ruttees.
Tartar Emetic	...	$\frac{1}{2}$ tolah.
Nitre (shora)	...	$1\frac{1}{2}$ tolahs.
To be given once a day in severe inflammations and fevers.		
63. Camphor (kufoor)	...	$1\frac{1}{2}$ tolahs.
Nitre (shora)	...	2 "

To be given morning and evening in gruel or beer.

A good prescription for Puschima or Gootee.

**XV.—External applications (Lotions).**

64. Sulphate of zinc	...	$\frac{1}{2}$ chittack.
Acetate of lead	...	$\frac{1}{2}$ "
Water	...	$\frac{1}{2}$ seer.
To be applied to weak and unhealthy sores, or injected in gonorrhœa.		
65. Sulphate of copper (tootea)	...	1 chittack.
Alum (phitkerie)	...	1 "
Water	...	2 seers.
To be applied to ulcers to assist healing.		
66. Nitrate of silver	...	2 tolahs.
Water	...	10 chittacks.
To be applied to diseased or ulcerated surfaces.		
67. Aloes (mosubber)	...	2 chittacks.
Myrrh (Gondobol)	...	1 chittack.
Spirit	...	2 seers.
Water	...	$\frac{1}{2}$ seer.

Filter after it has stood for 14 days.

A valuable application to ulcers or wounds.

68. Iodine	...	1 chittack.
Spirit	...	8 chittacks.

Let it stand for fourteen days and pour off clear fluid.

To be applied to sprains and swellings.

69. Sulphate of Zinc	...	$\frac{1}{2}$ chittack.
Water	...	$\frac{1}{2}$ seer.

To be applied to foul ulcers and unhealthy sores.

*70. Vinegar (sirca)	...	1 chittack.
Warm water	...	1 seer.

To be applied to eruptions of the skin.

**XVI.—Ointments.**

71. Venice Turpentine (gunda broga)	...	2 chittacks.
Black hellebore	...	1 chittack.
Fat (charbi)	...	$\frac{1}{2}$ seer.
Melt for twenty-four hours and strain through cloth, to smear setons with.		
72. *Sulphate of Copper	...	1 chittack.
Treacle (khar)	...	4 chittacks.
Boil till the color becomes red, to be applied to ulcers and foul sores.		
73. *Verdegris (zungul zungar)	...	1 chittack.
Venice turpentine (gunda Broga)	...	1 "
Wax (mow)	...	3 chittacks.
Cocoanut oil	...	3 "

Mix with the aid of heat, to be applied to ulcers.

**XVII.—Medicines which increase the rapidity of the pulse (stimulants).**

74. Sulphuric ether	...	$\frac{1}{2}$ chittack.
Camphor	...	$\frac{1}{2}$ "
To be given in one seer of beer and frequently repeated.		
75. Aromatic spirit of ammonia	...	$\frac{1}{2}$ chittack.
Nitric ether	...	$\frac{1}{2}$ "

To be given in one seer of beer and repeated frequently.

**XVIII.—Medicines which stop the issue of blood from a wound (styptics).**

76. Nitric acid (shora er drapoc).		
To be applied to bleeding part with a bit of cloth tied on a stick.		

77. Sulphate of Copper (tootea).  
To be rubbed against the bleeding surface.
78. Oil of Turpentine (tarpen tel).  
To be applied to bleeding surface.
79. Linseed oil (moshiner tel) ... 2 chittacks.  
Oil of turpentine (tarpen tel) ... 2 „  
To be given in thick rice or linseed gruel every hour.  
In bleeding from the bowels.
80. Acetate of lead ... 1 tolah.  
Mucilage .. 10 chittacks.  
Twice a day in bleeding from the bladder.
- XIX.—Medicines which improve the condition of the body (tonics).
- \*81. Sulphate of iron (hirekos) . ... 1 tolah.  
To be dissolved in beer, whey or water, and given three times a day.
- \*82. Powdered Cheretta root (chiretta) ... 1 tolah.  
„ Ginger (soot) .. 1 „  
„ Carraway (jeera) .. 1 „  
To be given once a day in beer, rice water, &c., in debility of stomach, gentian can  
be substituted for cheretta.
83. Sulphate of copper (tootea) ... 1 chittack.  
Carbonate of ammonia .. 1 „  
Water .. 1 seer.  
One and a half chittack of this to be given two ounce or three ounce a day in  
a seer of water, beer or whey.
84. Nitric acid (shora er drapoc) ... 1 chittack.  
Muriatic acid (lobun er drapoc) ... 2 chittacks.  
Ten to fifteen phuttas in water two ounce a day in jaundice and chronic liver  
diseases.
85. Nux Vomica (kuchla) .. 1 chittack.  
Spirit .. 4 chittacks.  
Filter after macerating for seven days; half a cutcha for a dose in paralysis.
86. Ergot .. 1 chittack.  
Gruel .. 1 seer.  
In delayed parturition or retained placenta, to be repeated in an hour if necessary.

## APPENDIX D.

### *Comparative view of English and Bengalee Weights and Measures.*

Apothecaries Weight.			Apothecaries fluid Measures.		
		R. A. P.			S. C. C.
1 Pound lb	..	42 8 0	1 Quart	...	2 8 0
1 Ounce	..	2 10 6	1 Pint	...	0 10 0
7 Drachms	..	2 5 3	1 Ounce	...	0 1 0
6 Ditto	..	1 15 6	7 Drachms	...	0 0 1 1/2
5 Ditto	..	1 10 3	6 Ditto	...	0 0 1 1/2
4 Ditto	..	1 5 3	5 Ditto	...	0 0 0
3 Ditto	..	0 15 9	4 Ditto	...	0 0 1 1/2
2 Ditto	..	0 10 6	3 Ditto	...	0 0 0 1/2
1 Drachm	..	0 5 3	2 Ditto	...	0 0 0 1/2
1/2 Ditto	..	0 2 7	1 Drachm	...	0 0 0 1/2
1 Grain	..	Nearly 1/4 ruttee	1 Scruple	...	20 phuttas.
			1 Drop	...	1 phutta or binthoo

One Pound weighs nearly half a pucci sir. A tolah weighs very nearly three drachms, and an ounce may be taken to be equal to two and a half tolah or half a chittack.



The License Tax.

Statement of Amount collected under Act XXI. of 1867, in the Lower Provinces.

	PRESIDENCY.						MOFUSSIL.		Total.
	Before reported.	FOR THE WEEK ENDING				Reported to close of De- cember 1867.	In January and February 1868.		
		15th February.		22nd February.					
Collections .....	4,58,181 9 5	2,284 4	1,756 0	9,80,428	33,278	14,84,927 13 5			
Deduct Refunds .....	32,108 5 7	904 0	187 8	69,216	4,261	1,06,676 13 7			
Remaining .....	4,26,073 3 10	1,380 4	1,568 8	9,20,212	29,017	13,78,250 15 10			
Deductions (at the Presidency by the Examiner of Claims) from sala- ries of servants under .....									
Government of India.	27,415 15 4					27,415 15 4			
Government of Bengal.	24,675 8 4					24,675 8 4			
Ditto at Mofussil Treasuries .....				71,642	527	72,169 0 0			
Ditto at other Local Offices .....				12,120	20	12,140 0 0			
Ditto in Military Department, less refunds, Rs. 2,023-5-4.						19,251 10 8			
Grand Total.....	4,78,164 11 6	1,380 4	1,568 8	10,03,974	29,564	15,33,903 2 2			

**Results of the Meteorological Observations taken at the Surveyor-General's  
Office, Calcutta, from 1st to 7th March 1868. .**

MONTH.	Date.	Reduced Reading of Barometer at 10 A. M.	THERMOMETER.		Daily Range of the Temperature.	Mean Temperature for the day.	Mean Wet Bulb.	Computed Mean Dew-point.	Mean Degree of humidity for the day.	Prevailing Direction of Wind during the day.	Rain.	Daily Velocity of Wind.	GENERAL REMARKS.
			Highest Reading.	Lowest Reading.									
		Inches.	°	°	°	°	°	°			Inches.	Miles.	
March ...	1st	29.875	88.0	63.5	22.5	74.5	65.7	59.5	0.61	Variable.	...	30.5	Chiefly clear. Slight foggy at 8 P. M.
	2nd	29.86	85.5	67.0	18.5	75.2	69.1	64.1	.67	S	...	35.2	Chiefly clear.
	3rd	30.005	89.2	69.5	19.7	77.8	71.2	66.6	.70	.....	...	85.8	Clear.
	4th	29.977	90.8	68.5	22.3	78.3	70.1	64.4	.64	S	...	125.4	Clear and scattered cirri.
	5th	28.68	92.7	71.5	21.2	79.9	70.6	64.1	.60	Variable.	...	159.3	Clear.
	6th	29.04	89.0	69.5	19.5	78.4	69.9	63.9	.62	S & Variable.	...	130.4	Clear.
	7th	28.63	83.0	68.5	14.5	74.9	68.7	64.4	.71	W by S & Variable.	...	98.1	Scuds from S and cumal

The mean Temperature and the mean Wet Bulb are derived from the twenty-four hourly Observations made during the day.

The Dew-point is computed with the Greenwich constants. The figures in column ten represent the humidity of the air, the complete saturation of which being taken at unity. The receiver of the lower rain gauge is 1 foot 2 inches, and that of the Anemometer 70 feet 10 inches, above the level of the ground. The velocity of wind as indicated by Robinson's Anemometer is Registered from noon to noon.

The extreme variation of Temperature during the past seven days			...	...	29.2
The Max. Temperature during the past seven days			...	...	92.7
The Max. Temperature during the corresponding period of the past year			...	...	94.2
The mean humidity during the past seven days			...	...	0.65
The mean humidity during the corresponding period of the past year			...	...	0.66
					Inches.
The total fall of rain from. 1st to 7th			...	{ by lower rain gauge	Nil.
			...	{ by Anemometer gauge	Nil.
Ditto	ditto	from 1st to 7th, average of fourteen previous years	...		0.50
Ditto	ditto	between the 1st January and the 7th current	...		0.23
Ditto	ditto	during the corresponding period of the past year	...		1.37

The 10th March 1868.

GOPEENAUTH SEN,  
In charge of the Observatory.

Meteorological Report up to 29th February 1868.

STATIONS.	February.	Hour.	Barometer reduced to 32°.	THERMOMETER.		Humidity Sat. = 100.	WIND.		Rain.	WEATHER.
				Dry.	Wet.		Direction.	Velocity.		
CALCUTTA.	22nd	10	30.009	81	71	59	E by N	...	...	Clear.
		16	29.869	87	71	42	W N W	...	...	Scattered cirri.
	23rd	10	29.918	81	75	74	S	...	...	Scattered cumuli.
		16	29.756	83	73	58	E	...	...	Nimbi and scuds from W. S. W. thunder and lightning to N. W.
	24th	10	29.772	77	73	81	S S W	...	0.18	Scattered cirrocumuli.
		16	29.694	82	74	66	N W	...	...	Ditto cirri and cumuli.
	25th	10	29.930	77	66	53	N	...	...	Clear.
		16	29.815	83	69	46	N N E	...	...	Ditto.
	26th	10	30.013	75	60	36	N	...	...	Scattered thin cirri to N. W. rest clear.
		16	29.886	80	69	30	N	...	...	Clear.
	27th	10	30.005	74	58	32	N W	...	...	Ditto.
		16	29.855	81	62	28	N	...	...	Ditto.
SANDWICH ISLAND.	22nd	10	29.943	74	62	44	S W	...	...	Ditto.
		16	29.792	75	66	34	N W	...	...	Ditto.
	23rd	10	29.893	74	61	55	N	...	...	Ditto.
		16	29.724	83	60	36	N	...	...	Ditto.
	24th	9-30	29.958	78	76	90	N W by W	Light	...	Ditto.
		16	29.858	81	77	82	S W by W	Light	...	Ditto.
	25th	9-30	29.876	79	78	86	S W by W	Moderate	...	Ditto.
		16	29.829	82	76	74	S W	Moderate	...	Ditto.
	26th	9-30	29.834	80	77	86	S W	Moderate	...	Ditto.
		16	?	83	78	78	S W	Moderate	...	Ditto.
	27th	9-30	29.873	77	66	53	N E	Moderate	...	Ditto.
		16	29.776	82	76	74	N	Moderate	...	Ditto.
CHITTAGONG.	22nd	9-30	29.816	76	67	60	N	Moderate	...	Ditto.
		16	?	82	64	45	N	Light	...	Ditto.
	23rd	9-30	29.857	74	61	58	N	Light	...	Ditto.
		16	29.739	82	65	35	N E	Light	...	Ditto.
	24th	9-30	29.899	75	68	68	N	Light	...	Ditto.
		16	29.757	82	71	55	S W by W	Light	...	Ditto.
	25th	9-30	29.854	77	71	73	N W	Light	...	Ditto.
		16	?	84	69	43	N	Light	...	Ditto.
	26th	9-30	29.913	78	73	86	S	Light	...	Cumuli, changing wind.
		16	29.831	73	70	85	S E	Light	2.55	Cumulostrati, heavy rain for last 3 hours.
	27th	9-30	29.864	72	71	95	N E	Light	...	Cumuli.
		16	29.709	74	72	90	S S E	Light	...	Nimbi.
ARAR.	22nd	9-30	29.740	74	72	90	S by E	Moderate	0.77	Cumuli.
		16	29.641	70	73	86	S S W	Fresh	...	Stratoni towards N. and N. W. changing wind.
	23rd	9-30	29.786	75	73	90	N N E	Light	1.83	Cumuli, heavy rain this morning.
		16	29.711	77	73	81	S W by W	Light	...	Cumuli towards N. and N. E. and E.
	24th	9-30	29.864	72	67	75	S W by W	Light	...	Clear.
		16	29.779	74	68	72	W	Light	...	Ditto.
	25th	9-30	29.849	70	59	48	S W by N	Light	...	Ditto.
		16	29.774	72	61	68	W	Light	...	Misty horizon.
	26th	9-30	29.822	69	62	65	S W by W	Light	...	Ditto.
		16	29.702	74	65	69	S W	Light	...	Ditto.
	27th	9-30	29.742	69	65	79	N E by N	Light	...	Ditto.
		16	29.620	74	68	72	W	Light	...	Clear.
CUTTACK.	22nd	9-30	30.019	77	73	81	E	Moderate	...	Very foggy morning, cirrostrati and misty horizon.
		16	29.862	80	75	78	W	Moderate.	...	Cirrostrati and cumulostrati.
	23rd	9-30	29.945	75	73	90	N W	Light.	...	Low scuds from S. W. this morning, thin cirri to S. W. and hazy.
		16	29.810	81	75	74	S W	Light.	...	Equally from 11 A. M. cirri to N. E. and N. W. misty horizon, unsteady wind.
	24th	9-30	29.860	77	71	86	S E	Light.	...	Hazy clear sky.
		16	29.810	81	75	74	S W	Light.	...	Scattered cirri and cirrostrati, and misty, unsteady wind.
	25th	9-30	29.920	77	74	88	S E	Light.	...	Clear unsteady wind.
		16	29.820	81	76	78	S W	Light.	...	Cirrostrati to N. W. and fine.
	26th	9-30	29.908	74	75	86	N E	Light.	...	Scattered cirri and cirrostrati.
		16	29.817	81	75	71	W	Light.	...	Scattered cirri and misty.
	27th	9-30	29.891	73	65	62	W	Moderate.	...	Hazy clear sky.
		16	29.815	79	70	61	W	Moderate.	...	Unsteady wind. Misty horizon.
CUTTACK.	22nd	9-30	29.869	70	61	67	N	Light.	...	Clear and calm.
		16	29.805	79	71	65	W	Moderate	...	Clear misty horizon.
	23rd	9-30	29.854	72	66	71	N E	Light.	...	Clear and cloudless.
		16	29.813	70	70	72	S	Light.	...	Unsteady wind, misty horizon.
	24th	9-30	30.040	79	75	82	S by E	...	...	Very foggy morning, cirrostrati and misty horizon.
		16	29.895	84	75	64	S E by E	...	...	Cirrostrati and cumulostrati.
	25th	9-30	29.997	81	73	66	S S W	...	...	Low scuds from S. W. this morning, thin cirri to S. W. and hazy.
		16	29.795	85	71	47	S S E	...	...	Equally from 11 A. M. cirri to N. E. and N. W. misty horizon, unsteady wind.
	26th	9-30	29.844	81	73	68	W by N	...	...	Hazy clear sky.
		16	29.725	86	71	54	S S E	...	...	Scattered cirri and cirrostrati, and misty, unsteady wind.
	27th	9-30	29.949	79	68	51	E by N	...	...	Clear unsteady wind.
		16	29.837	84	69	43	E	...	...	Cirrostrati to N. W. and fine.

STATIONS.	February.	Hour.	Barometer reduced to 32°.	THERMOMETER.		Humidity Sat. = 100.	WIND.		Rain.	WEATHER.
				Dry.	Wet.		Direction.	Velocity.		
MADRAS.	22nd	10	30.006	81	75	74	S E	7*	...	Light clouds.
	16		29.878	83	77	75	E S E	7*	...	Clear.
	23rd	10	30.003	83	72	56	S E by S	8*	...	Light clouds.
	16		29.852	83	74	63	E S E	8*	...	Clear.
	24th	10	29.925	82	73	63	S S W	8*	...	Light clouds.
	16		29.781	83	74	63	S E by S	13*	...	Clear.
	25th	10	29.893	83	74	63	S S E	10*	...	Passing clouds.
	16		29.789	83	75	67	S E	13*	...	Clear.
	26th	10	29.923	83	75	67	S	5*	...	Light clouds.
	16		29.821	83	75	67	E	10*	...	Ditto.
DARJEELING.	27th	10	29.971	84	74	80	E N E	6*	...	Ditto.
	16		29.876	83	74	63	N E	13*	...	Fine with light clouds.
	28th	10	30.018	83	78	61	N	7*	...	Passing clouds.
	16		29.895	86	75	57	N E	12*	...	Clear.
	29th	10	29.977	86	74	54	S W	6*	...	Ditto.
	16		29.811	92	73	37	N E by E	11*	...	Ditto.
	22nd	9-30	23.246	45	41	92	S E	Light	...	Misty.
	16		23.226	46	45	92	W by S	Light	...	Dense mist.
	23rd	9-30	23.224	42	42	100	W	Moderate	...	Ditto.
	16		23.142	45	43	84	W S W	Moderate	...	Misty.
BANGALORE.	24th	9-30	23.060	46	42	69	W N W	Moderate	...	Cirrostrati to N., rest surrounded with dense mist.
	16		23.003	60	45	64	W by N	Moderate	...	Scattered cumuli.
	25th	9-30	23.110	46	33	6	W	Light	...	Clear sky.
	16		23.078	51	41	52	W	Light	...	Cumuli round horizon, rather heavy towards S. W.
	26th	9-30	23.142	44	43	91	E	Light	...	Frosty morning clear sky.
	16		23.692	50	44	58	W	Light	...	Wooly cumuli resting on hills towards N. W.
	27th	9-30	23.192	42	40	82	E	Light	...	A few thin clouds only.
	16		23.152	43	42	91	E by S	Light	...	Scattered cumuli.
	28th	9-30	23.224	47	42	62	E by N	Light	...	Misty.
	16		23.150	49	41	63	E N E	Light	...	Clear, slight hoar frost this morning.
POONKEE.	29th	30	13.210	52	41	47	W by S	Light	...	Misty.
	16		23.123	61	51	45	W S W	Light	...	Clear sky.
	22nd	10	29.757	...	...	...	S E	...	...	Cirrostrati, cumuli round horizon.
	16		29.640	...	...	...	W	...	...	Cirri, strati.
	23rd	10	29.621	...	...	...	E	...	...	Cirrocumuli strati.
	16		29.626	...	...	...	N E	Moderate	...	Cumuli, strati.
	24th	10	29.611	...	...	...	N W	Moderate	...	Ditto.
	16		29.559	...	...	...	W	...	...	Cumuli, cumulostrati.
	25th	10	29.716	...	...	...	N W	...	...	Cumuli, strati.
	16		29.650	...	...	...	W	Moderate	...	Strati.
POONKEE.	26th	10	29.784	...	...	...	S W	Moderate	...	Ditto.
	16		29.696	...	...	...	W	Strong	...	
	27th	10	29.773	...	...	...	W	Moderate	...	
	16		29.671	...	...	...	W	Strong	...	
	28th	10	29.744	...	...	...	W	Moderate	...	
	16		29.614	...	...	...	W	Strong	...	
	29th	10	29.707	...	...	...	W	Moderate	...	
	16		29.562	...	...	...	W	Moderate	...	
	22nd	9-30	28.979	58	57	93	E	...	10	Drizzling rain up to 10 to 11 hours & again at 14-30.
	16		28.854	60	57	82	N E	...	...	Heavy rain at 9 hour & from thence to 14 hour it continued to rain at interval, at 17 hour heavy rain again commences accompanied with hail, lightning and thunder, hail storms as large as hazel nuts.
POONKEE.	23rd	9-30	28.944	60	58	88	S W	...	52	Rain in early morning, clear at 5 hour, cumuli gathering at 13 hour. The upper stratum of clouds moving from S. to N. and lower from W. to E. heavy shower with thunder and lightning at 19 hour.
	16		28.804	61	60	78	E	...	...	Few cumuli on the hills and cirri overhead, rest of sky clear, sharp S. W. wind from 14 to 16.
	24th	9-30	28.890	60	54	65	Calm	...	1.13	Fine clear cloudless day, snowy range seen with extreme clearness. Mis-sourie hills covered with snow. Brisk N. W. wind at 16 hour.
	16		28.833	63	55	56	S W	...	...	Cumuli in the S. W. brisk N. W. wind from 14 hour till sun set.
	25th	9-30	29.056	60	54	65	Calm	...	13	Brisk N. W. wind from 5 hour to 17 hour.
	16		29.015	66	54	40	S W	...	...	Brisk N. W. wind at 5 hour changing to strong W. at 12 hour, clearing and till 18 hour.
	26th	9-30	29.102	61	54	60	W	...	...	
	16		29.034	68	56	42	N W	...	...	
	27th	9-30	29.081	63	56	61	S W	...	...	
	16		29.053	69	58	47	N W	...	...	
	28th	9-30	29.084	67	59	59	N W	...	...	
	16		28.954	74	61	43	N W	...	...	
	29th	9-30	28.979	66	58	58	N W	...	...	
	16		28.870	77	61	34	N W	...	...	

STATIONS.	February.	Hour.	Barometer reduced to 32°.	THERMOMETER.		Humidity Sat. = 100.	WIND.		Rain.	WEATHER.
				Dry.	Wet.		Direction.	Velocity.		
Dacca.	22nd	0-30	29.910	77	74	86	S W	...	1.4	Light wind. Heavy rain at 0-30 this morning.
		10	29.818	78	74	81	E N E	...	...	Light wind and cool.
	23rd	0-30	29.893	76	75	95	S S W	...	...	Light wind and cool.
		10	29.762	69	67	89	N E	...	...	Light wind and cool.
	24th	0-30	29.724	72	70	90	E S E	...	3.1	Light wind, cloudy, heavy rain since morning.
		10	29.564	70	75	95	W	...	...	Light wind, clear weather, fine since noon.
	25th	0-30	29.811	73	68	76	N N W	...	...	Light wind, partially cloudy.
		10	29.754	75	68	68	N W	...	...	Light wind, clear.
	26th	0-30	29.914	71	63	61	N W	...	...	Light wind, clear.
		10	29.811	73	62	50	W N W	...	...	Light wind, clear.
FAIRFORD.	27th	0-30	29.806	71	63	61	N N W	...	...	Light wind, clear.
		10	29.784	73	61	49	W	...	...	Light wind, clear.
	28th	0-30	29.830	71	65	75	N W	...	...	Light wind, clear.
		10	29.764	73	63	58	W	...	...	Light wind, clear.
	29th	0-30	29.777	71	64	66	N	...	...	Light wind, clear.
		10	29.614	72	65	66	E S E	...	...	Light wind, clear.
	16th	0-30	29.665	75	71	90	N N E	...	...	Light wind with fog.
		10	29.555	75	70	73	N E	...	...	Light wind, no fog.
	17th	0-30	29.608	74	70	81	N W	...	...	Light wind, clear.
		10	29.506	74	74	81	S	...	...	Light wind, clear.
PATNA.	18th	0-30	29.907	78	75	80	W	...	...	Light wind, clear.
		10	29.815	79	75	83	S	...	...	Light wind, clear.
	19th	0-30	29.927	74	71	81	S S W	...	...	Light wind, clear.
		10	29.812	79	70	61	N N E	...	...	Moderate breeze.
	20th	0-30	29.778	78	75	86	S W	...	...	Strong breeze and fine.
		10	29.755	79	70	80	S W	...	...	Light wind, clear.
	21st	0-30	29.817	82	77	74	W S W	...	...	Moderate weather and fine.
		10	29.770	81	74	80	S W	...	...	Strong breeze and fine.
	22nd	0-30	29.824	83	78	78	S W	...	...	Strong breeze and fine.
		10	29.827	82	78	62	S W	...	...	Moderate breeze.
	23rd	0-30								
		10								
	24th	0-30	29.614	75	63	41	W	...	...	Rain yesterday, thunder storm with hail from W.
		10	29.614	79	65	43	W	...	...	Rain brewing.
	25th	0-30	29.710	74	61	43	W	...	...	Great blast from N. at 3-45 A. M. with heavy hail.
		10	29.609	70	60	47	N	...	...	Stormy day.
	26th	0-30	29.584	69	64	74	S E	...	...	Fine day, again cold.
		10	29.540	71	60	75	E	...	...	W. wind strong and cold.
	27th	0-30	29.584	71	67	80	E	...	...	Very cold and windy.
		10	29.542	69	64	74	W N W	...	...	

BENGAL SECRETARIAT,  
The 7th March 1868.

HENRY F. BLANFORD,  
Meteorological Reporter to Govt. of Bengal.



# SUPPLEMENT TO The Calcutta Gazette.

WEDNESDAY, MARCH 18, 1868.

## OFFICIAL PAPERS.

*Non-Subscribers to the GAZETTE may receive the SUPPLEMENT separately on a payment of six Rupees per annum if delivered in Calcutta, or twelve Rupees if sent by Post.*

### Reports on the State of the Rice Crops in the Several Divisions of the Lower Provinces.

*Abstract of Reports received regarding the actual results of the Rice Harvest,  
and the prospects of the Rubbee Crops, on the 1st January 1868.*

#### DACCA DIVISION.

*Backergunge.*—The rice harvest throughout this District will be good, the late storm having done little or no damage. The rubbee crops also promise well.

*Cachar.*—The Deputy Commissioner during his visit into the interior found that in most places the early rice crops were extremely good; in fact, better than those of last year, which was considered an unusually good one. The out-turn of the entire District will be much more than it was in any of the years between 1860 and 1866, with the exception of mustard seed, which is promising. No rubbee crops are sown.

*Dacca.*—The loss of rice from the late Cyclone is estimated at about a fifth. On the whole, however, the harvest has been a good one, and its yield has been more than those of ordinary years.

*Furreedpore.*—The rice crops are somewhat better than those of ordinary years, but the rubbee crops are not generally considered very promising.

*Mymensing.*—The early rice harvest was an extremely abundant one, and in the Sub-division of Jumalpoore is said to be 30 per cent. above the average. The amun or late rice crop suffered somewhat from the late storm, is somewhat below the average, probably about a 14-anna crop. The rubbee crop will, it is expected, be about the average of ordinary years.

*Sylhet.*—The rice crops have been much better than they had been for several years. The rubbee crops which did not promise well some time ago are now expected to turn out well, though they are comparatively of little importance in this District.



## BHAUGULPORE DIVISION.

*Bhaugulpore.*—The rice harvest in the south of the District, although not quite so good as that reaped last year, was fair. On the mouth of the river a full average crop was reaped. The prospects of the rubbee crops are good.

*Purneah.*—Except in a part of the south of the District, submerged during the late inundation, the rice harvest was unusually plentiful. The present low prices of rice in this District have been unknown for the last fifteen years. The prospects of the rubbee crops are good.

*Deogurh.*—The out-turn of the rice crop has exceeded any of the last ten or fifteen years. The small area sown with rubbee looks well.

*Nya Doomka.*—The rice harvest in the year under review is reported as the best known since the Sonthal rebellion of 1856. The rubbee crops are flourishing.

*Rajmehal.*—The yield of the rice crop was as good as that of the preceding year. Prospects of the spring crops fair.

*Godda, Pakour.*—The rice crop was a fair average one, but blight injured it in some places. The rubbee crops promise well.

## RAJSHAHYE DIVISION.

*Bograh.*—Though some damage was done by the high wind and rain in November, to the more forward portion of the crop, the Collector considers that it was more than compensated for by the good done to the backward crops, the damage was much exaggerated, while the cheapness of rice seems to shew that there is no fear of a deficient crop. The principal cold weather crops, mustard, sugar, and mulberry, promise very well.

*Dinagpore.*—The out-turn of rice has been very good, a little damage was done by the November storm, but on the whole a 15 anna crop has been secured. The prospects of the cold weather crops are very good.

*Maldah.*—Wherever the country was not affected by the Ganges inundation, the crop of rice has been very good indeed. In the inundation tracts the cold weather crops promise to more than compensate the ryots for the loss of their rice, owing to the richness of the alluvial deposit.

*Moorshedabad.*—The rice harvest has been a full average one, as compared with that of years previous to the late scarcity. The prospects of the cold weather crops are most favorable.

*Pubna.*—The crops appear to be slightly below the average, in consequence of the damage done by the late Cyclone. The prospects of the cold weather crops are good.

*Rajshahye.*—The result of the rice harvest is most satisfactory throughout the District. The Collector says nothing about the cold weather crops, but the Commissioner states there need be no apprehensions on that account.

*Rungpore.*—The rice crop is expected to be in some places only a 12-anna one, owing to some damage done by the rain in November, and to drought in the earlier part of the season. The cold weather crops are coming on well. The Commissioner does not see the slightest cause for anxiety with regard to any portion of his Division.

## COOCH BEHAR DIVISION.

*Gowalparah.*—The rice harvest is good. The Cyclone did not cause much injury to the rubbee crops, which promise well.

*Western Dooars.*—The rice crop has been a good average one. There is no rubbee crop worth mentioning, but ryots are beginning to cultivate both wheat and barley, and the Commissioner is in hopes that in a few years a considerable quantity of these grains will be grown.

*Darjeeling.*—In the hills the high land crops of rice, Indian corn, and murwa, have been a failure, owing to the early fall of rains. But the rice harvest on the banks of rivers in the hills has been an average one. In the plains, owing to abundance of rain, the rice harvest is unusually good. The rubbee crops in both hills and plains are very promising.

## BURDWAN DIVISION.

*Bancoorah.*—In the Head-Quarters Sub-Division of this District the out-turn has been equal to, if not rather in excess of, that of an average year, and the prospects of the rubbee crop within the same circle are pronounced most satisfactory.

*Raneegunge Sub-Division.*—The rice harvest is reported to be even better than that of ordinary years, and the prospects of the rubbee are equally good.

In *Gurbetta* the gale had some slight effect on the out-turn of the rice crop, the loss in some places being estimated at about a quarter of the growing crop. The rubbee crop is expected to be nearly equal to the average.

*Bood-Bood Sub-Division.*—The rice crop had been a full average one, and the prospects of the rubbee crop are excellent.

*Beerbhoom.*—The rice harvest, though not as plentiful as that of the year previous, has been abundant, and the prospects of the rubbee crop are promising.

*Burdwan.*—Excepting the Sub-Division of Raneegunge the rice harvest in this District was on an average a 13-anna crop, compared with that of ordinary years. The rubbee crop is not expected to yield more than one-half an average out-turn.

*Hooghly.*—Throughout the Sudder and Serampore Sub-Divisions the rice harvest is estimated at from 12 to 14 annas of an ordinary crop. There appears to be general contentment, and prices keep down, being lower than they have been for the last three years. The rubbee crop has suffered more or less, and the probable out-turn is estimated as low as 3-4ths of an average crop.

*Jehanabad Sub-Division.*—The damage done to the rice crop by the late storm is estimated at about 2 annas, and the out-turn might be put down at 14. The prospects of the rubbee crop are very promising.

*Howrah.*—The average yield of the rice crop is estimated at about 3-4ths of that of preceding years. Owing to the late sowings of the rubbee crops the harvest is expected to be a poor one, probably not more than one-half that of ordinary years.

*Midnapore.*—The harvest has been reaped with great success, and its out-turn is estimated at a good 14 anna crop (13 annas being an ordinary one.) The rubbee is unusually fine, and a greater area has been sown, compared with that of previous years.

#### CHITTAGONG DIVISION.

*Chittagong.*—The rice crop has been a full average one throughout this District, rather more so indeed in the northern half of the District. The rubbee crops promise well.

*Tipperah.*—Altogether the rice harvest of Tipperah is rather above the average. The prospects of the rubbee crops are reported to be good from all Stations, except Hajecgunge and Daoodcandy, where the crops having been sown early were damaged by the Cyclone.

*Noakhally.*—The rice harvest has been a favorable one, and but for the Cyclone would have been remarkably good. The prospect of the rubbee crop is not so favorable as usual, though there is no serious loss anywhere. The Commissioner, in summing up the prospects of his Division, states that the harvest may be pronounced satisfactory, and the prospects of the rubbee crops slightly below the average.

#### ASSAM DIVISION.

*Kamroop.*—The rice harvest has been favorable, with the exception of mustard, which promises well; there are no rubbee crops.

*Durrung.*—The rice crops have been unusually heavy, but the rubbee crops are not very promising, owing to the want of rain.

*Nowgong.*—The rice harvest has been above the average. The prospects of the rubbee crop are everywhere good.

*Cossyah and Jynteah Hills.*—The rice harvest has been a fair one, and the rubbee crops are coming on well.

*Sebsaugor and Luckimpore.*—Reports not yet received.

*Chota Nagpore, Lohardugga.*—The rice crop is believed to have been a full one, and the prospects of the rubbee crops are very fair.

*Hasdreebaugh.*—The rice crop has been full 16 annas, and in many instances above that rate. The prospects of the rubbee crops are favorable, and a larger area than usual has been cultivated.

*Maunbhoom.*—A full crop of rice has been secured in all the Pergunnahs of this District, except Chatna, Koelapal, and Maunbhoom, where a 12-anna crop only is expected. Prospects of the rubbee are good.

*Singbhoom.*—The rice harvest on the whole has been an average one, but in some parts of the District there was a deficiency, owing to the failure of the intermediate rice crop, from want of rain. The Commissioner is in receipt generally of favorable reports from the Tributary Mehals. In the southern Tributary Mehals visited by him there has been an abundant harvest of rice, and the appearance of the crop on the ground was favorable.

#### PATNA DIVISION.

*Patna.*—The out-turn of the rice crop is everywhere excellent, surpassing that of average years by one-fourth to one-half. The rubbee promises well.

*Gya.*—Rice crop has been everywhere satisfactory, the yield being in excess of that of an ordinarily favorable season. Rubbee crop also promises well as yet.

*Sarun.*—The season was favorable, but owing to heavy rain and flood there has been some loss in Pergunnahs Goah, Muckeir, and Murhul. In other places the result is more favorable than those of ordinary years.

The prospects of the rubbee are everywhere good.

*Shahabad.*—The rice crop has been a full one. The rubbee does not promise to be so good as it was at first anticipated; it is estimated to yield a crop of from 8 to 10 annas.

*Tirhoot.*—The out-turn in the Sudder Division has been estimated at 12 annas. Rubbee promises well.

*Hajepore Sub-Division.*—The rice crop is an 8-anna one, but the rubbee is excellent.

*Tajpore Sub-Division.*—The result of the rice harvest in some parts is from 12 to 14 annas, while in others from 8 to 10; there is every prospect of a fine rubbee crop.

*Durbhungah Sub-Division.*—In the north-west part the crop is a 12 anna one, which is less than the average; but everywhere else the out-turn is above that of average years. Rubbee sowings doing well, but owing to bad weather ruhr and surso have suffered.

*Modhobunnce Sub-Division.*—Rice average and rubbee good.

*Sectamarce Sub-Division.*—The out-turn of the rice crop is 14 annas. Rubbee doing well, but requires rain to bring it on.

*Chumparun.*—The rice harvest favorable, as compared with ordinary years; some fear is entertained for the rubbee crop for want of rain.

The Commissioner observes that the rice harvest throughout his Division has been an excellent one, and the prices are lower than they have been for years. From the latest returns rice is no where selling at less than 26 seers per Rupee, while in many marts the rate is 38 seers, and upwards. The rubbee crops have been much benefitted by a recent fall of rain.

#### PRESIDENCY DIVISION.

*Jessore Sudder Sub-Division.*—The rice crop has been about 3-4ths of the expected out-turn. The Collector is of opinion that the crop has been within about 1-8th of an average one. A very considerable area in excess of that usually sown had been laid down in rice. The crops before the Cyclone were very good indeed; and supposing 4 annas of the crop to have been destroyed, the Collector does not think the actual loss has been more than 2 annas, compared with the out-turn of ordinary years. The cold weather crops are not favorably spoken of. Towards the south and south-west of the District doubts are entertained if there will be 1-4th of an average crop of mustard, linseed, peas, &c. Towards the west and south-west of the Sub-Division prospects are somewhat better; but at the best calculation the crop is estimated at about a sixth; some damage has been done to the date trees, and the produce they will yield is reckoned about a fourth less than that of ordinary years. The Collector speaks of a kind of rice grown in some parts of the District called "Booro" not "Boro." It ripens very quickly, and is reaped at a time when other rice crops are gone. This, it is thought, would



come in very useful in years of scarcity. The Collector states that he will make further enquiries about it.

*Jenidah Sub-Division.*—About 3-4ths of an ordinary crop, and though it cannot be compared with that of last year, which was a very full one, yet the yield will fully compensate the cultivators. The cold weather crop sown late is expected to be about half that of ordinary years.

*Bagirhat Sub-Division.*—The rice crop will fall short of that of ordinary years by about 3-16ths. The prospects of the cold weather crops are very poor; but this Sub-Division is not much adapted to the growth of such crops. The rice crop is what the people depend on, and the chief addition to their means of livelihood derived from it is betlenuts and cocoanuts, in which a considerable trade prevails.

*Khoolnah Sub-Division.*—The Chotna rice has been considerably damaged, but not the Baran. The Deputy Collector estimates the loss at about 6 annas, but the Collector thinks this high, and reckons the loss at the utmost at 4 annas. The prospects of the cold weather crops are not cheering, and the out-turn is estimated at about a half crop.

*Narail Sub-Division.*—Considering that the crop has been an unusually good one, the result of the rice harvest is reckoned at about 6-16ths of a redundant and 4-16ths of an usual crop, compared with that of former years. The prospects of the winter crops are bad, owing to the protracted and high inundation followed by the Cyclone.

*Magoorah Sub-Division.*—The actual result of the rice crop is not equal to that of last year, though as good as in the previous two years. Cold weather crops are not very promising, but the Commissioner observes that the cold weather crops of the District are not important.

**24-PERGUNNAHS.**—*Diamond Harbour Sub-Division.*—The rice crop is estimated at a little above half the quantity of ordinary years.

*Barriepore Sub-Division.*—The estimate is about from 50 to 70 per cent. of ordinary years.

*Sudder Sub-Division.*—The crop is on an average about half of an ordinary one, rather more than less.

*Baraset Sub-Division.*—The out-turn is about  $\frac{3}{4}$ ths of an ordinary year.

*Dum-Dum Sub-Division.*—The loss of crop is estimated at 6 annas.

*Busseerhaut Sub-Division.*—The crops on the dangoli land have been to a certain extent affected, but not those on the low lands. The damage resulting from the Cyclone is estimated at from 4 to 8 annas; but, as before the Cyclone the promise was so luxurious, the yield will not be on an average more than 2 annas less than an ordinary crop. Cold weather crops are grown to a limited extent only.

*Satkhira Sub-Division.*—The out-turn of the rice harvest is estimated at about half in Kaligunga and Assasonee, and 10 annas in Satkhira. With regard to the cold weather crops, mustard and linseed are grown for home consumption, and only a 4 anna crop is expected.

No reports received yet from Nuddea and the Soonderbuns.

#### CUTTACK DIVISION.

*Cuttack.*—The sarud or late rice harvest has been gathered, and the crop is a very fine one. In most of the sea coast pergunnahs some little loss was caused by the gale. The out-turn is estimated at about 2-16ths less than it would otherwise have been. The damage has, however, been very limited, has called forth no specific complaint, and the people are well satisfied with the harvest. The Collector states that there is not the slightest cause for anxiety, and that putting aside the Government stock of rice, the supply of food is sufficient for the year. The Pergunnahs most backward in cultivation are situated in the Jajpore Sub-Division, including Aul, Kaimah, Borrah, and Coojung. Throughout the central and western portions of the District, the cultivation has been extensive, the harvest good, and the yield plentiful. Pergunnahs Puddumpoor, Kurmole, Toongra, Mattentnuggur, Dajoorah, Kharivalkhund, Koodnida, Joypore, Paindah, Tuppunkhund, Sabong, and

Koorkookhurd, are specially noticed as not having an acre of land out of cultivation. The Commissioner states that generally there has been a good average harvest. The rubbee harvest promises well, though the area under pulse and cereals always bears a very small proportion to that on which rice only is produced.

*Pooree.*—The season had been unusually favorable to rice cultivation, owing to the moderate and well distributed rain-fall, as also to the absence of destructive inundation, with the exception of an almost inappreciable loss from blight, and a few days rain in parts of Serai, Bulbudderpoor, and the tracts lying north of the Chilka. The crops in all the remaining cultivated area of Pooree have been above the average.

In the Khoordah estate the people are in a very prosperous condition, the area cultivated being nearly equal to that of ordinary years.

In Kotdesh and Kotrehang very little land was left unsown, and the crop is a full one.

Pergunnah Lambai, which is subject to periodical loss from inundation of the Doyah River, is fully cultivated this season.

Serai, where the people's sufferings were extreme, has been for the most part cultivated, and the crop will average 7-8ths of a full yield.

Rahang Pergunnah is fully cultivated in its eastern parts, and the crops are good. Towards the west however, and bordering on Chowbeesood, the people are still much depressed and impoverished, and more than half the land is fallow. Here the effects of the famine still linger.

In Chowbeesood only about one-half of the lands are cultivated, though liberal Tuccavee advances were given, the money appears to have been partly expended in purchasing food instead of seed only.

Manikputun and Audharee are similarly situated, and the cultivation amounts to about 10-16ths of the whole.

In Sathpara, where the mortality exceeded 50 per cent., the remaining population has wonderfully recovered; and 10-16ths of the land cultivated.

Kadhar has recovered considerably, and escaped inundation. Here and in Murichpore, Astrong, Koorloo, Banchas, Poobdoai, and Pochundoai, 3-4ths of the lands have been cultivated. Generally the year's harvest is sufficient to supply the population, and though the poorer classes will not recover their prosperity for some time, the Collector sees no cause for apprehension that food will not be forthcoming.

Rubbee cultivation is limited and affects rather the margin of profit and comfort to the more prosperous classes than the supply of food to the poorer. The out-turn is expected to be equal to that of ordinary years.

*Balasore.*—The rice harvest has been excellent throughout the District. Prices have fallen to their former level, and rice is procurable at from 26 to 51 seers per Rupee, the rate of ordinary years being about 50 seers. Prospects of the rubbee crop are exceedingly good.

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Results of the Meteorological Observations taken at the Surveyor-General's Office, Calcutta, from 8th to 14th March 1868.

MONTH.	Date.	Reduced Reading of Barometer at 10 A. M.	THERMOMETER.		Daily Range of the Temperature.	Mean Temperature for the day.	Mean Wet Bulb.	Computed Mean Dew-point.	Mean Degree of humidity for the day.	Prevailing Direction of Wind during the day.	Rain.	Max : Pressure of Wind.	Daily Velocity of Wind.	GENERAL REMARKS.	
			Highest Reading.	Lowest Reading.											
		Inches.	°	°	°	°	°	°				Inches.	lb	Miles.	
March ...	8th	29.916	81.0	82.7	18.3	71.0	60.1	50.9	0.50	W S W & N	...	...	128.4	Clear.	
	9th	30.018	86.0	65.0	21.0	74.7	66.7	61.1	.64	S & S by E	...	...	84.2	Chiefly clear.	
	10th	29.986	86.1	68.0	18.1	75.6	68.6	63.7	.68	S and S S W	...	...	127.2	Scattered clouds.	
	11th	.995	82.0	65.7	16.3	73.0	64.3	57.3	.80	S W & variable.	...	...	204.6	Chiefly clear.	
	12th	30.106	83.0	64.5	18.5	73.9	63.4	56.0	.55	W by S	...	...	93.5	Clear.	
	13th	.050	87.0	65.5	21.5	75.8	66.2	59.5	.59	W S W & S by W	...	...	81.4	Clear.	
	14th	29.962	90.0	72.0	18.0	79.3	73.0	69.6	.73	S S W & S by W	...	1.8	151.3	Chiefly clear.	

The mean Temperature and the mean Wet Bulb are derived from the twenty-four hourly Observations made during the day.

The Dew-point is computed with the Greenwich constants. The figures in column ten represent the humidity of the air, the complete saturation of which being taken at unity. The receiver of the lower rain gauge is 1 foot 2 inches, and that of the Anemometer 70 feet 10 inches, above the level of the ground. The velocity of wind as indicated by Robinson's Anemometer is Registered from noon to noon.

				⊖
The extreme variation of Temperature during the past seven days	...	...	...	27.3
The Max. Temperature during the past seven days	...	...	...	90.0
The Max. Temperature during the corresponding period of the past year	...	...	...	91.7
The mean humidity during the past seven days	...	...	...	0.61
The mean humidity during the corresponding period of the past year	...	...	...	0.68
				Inches.
The total fall of rain from 8th to 14th ...				Nil.
{ by lower rain gauge				Nil.
{ by Anemometer gauge				Nil.
Ditto ditto from 1st to 7th, average of fourteen previous years	...	...	...	0.12
Ditto ditto between the 1st January and the 14th current	...	...	...	0.23
Ditto ditto during the corresponding period of the past year	...	...	...	1.47

The 16th March 1868.

GOPEENAUTH SEN,  
In charge of the Observatory.



Meteorological Report up to 7th March 1868.

STATIONS.	March.	Hour.	Barometer reduced to 32°.	THERMOMETER.		Humidity Sat. = 100.	WIND.		Rain.	WEATHER.
				Dry.	Wet.		Direction.	Velocity.		
			Inches.	°	°				Inches.	
CALCUTTA.	1st	10	29.875	80	68	51	S	...	...	Clear.
	18	18	29.755	85	68	37	W	...	...	Scattered cumuli.
	2nd	10	29.906	80	72	66	S	...	...	Clear.
	18	18	29.865	88	70	41	...	...	...	Scattered cumuli.
	3rd	10	30.005	81	73	68	...	...	...	Clear.
	16	16	29.880	89	74	48	S by W	...	...	Ditto.
	4th	10	29.977	81	74	70	S W	...	...	Ditto.
	16	16	29.816	90	76	50	S	...	...	Scattered cirri.
	18	18	29.888	83	72	56	W	...	...	Clear.
	6th	10	29.722	83	73	35	S by W	...	...	Ditto.
SAUGOR ISLAND.	18	18	29.904	80	68	51	N N E	...	...	Ditto.
	7th	10	29.771	88	72	43	S by E	...	...	Ditto.
	18	18	29.803	77	73	81	S W	...	...	Scattered cirrocumuli above the zenith rest with cumuli.
	16	16	29.736	81	68	48	N N W	...	...	Scattered cumuli.
	1st	9-30	29.843	78	71	69	S W	...	...	Clear.
	16	16	29.828	81	74	70	S W	Moderate	...	Ditto.
	2nd	9-30	29.901	78	70	65	N	Light	...	Scattered clouds to S. E.
	18	18	29.847	82	74	60	S W	Light	...	Clear.
	3rd	9-30	29.956	79	75	82	W	Light	...	Ditto.
	16	16	29.885	82	70	52	S W	Light	...	Ditto.
CHITABONG.	4th	9-30	29.954	80	76	82	W	Light	...	Ditto.
	16	16	29.814	83	76	71	S W	Light	...	Ditto.
	5th	9-30	29.823	81	76	78	S W	Light	...	Ditto.
	16	16	29.730	84	78	75	S	Light	...	Ditto.
	6th	9-30	29.858	79	75	82	N	Light	...	Ditto. Scattered clouds early this morning.
	18	18	29.754	83	77	75	S W	...	...	Ditto.
	7th	9-30	29.792	82	76	74	N	Light	...	Clouds in eastern, western and southern horizon.
	18	18	29.092	84	78	75	W	Light	...	Cloudy.
	1st	9-30	29.749	70	67	84	S E by S	Light	...	Misty horizon.
	16	16	29.776	75	69	72	S W	Light	...	Ditto.
ARTAR.	2nd	9-30	29.831	74	69	70	E S E	Fresh	...	Hazy.
	18	18	29.781	77	72	77	S W	Light	...	Ditto.
	3rd	9-30	29.708	74	70	81	N E	Light	...	Ditto.
	16	16	29.795	78	75	86	S W by W	Light	...	Misty horizon, unsteady wind
	4th	9-30	29.858	75	73	90	S W	Light	...	Hazy.
	16	16	29.728	78	75	86	W S W	Light	...	Misty horizon, unsteady wind
	5th	9-30	29.761	77	74	86	W S W	Light	...	Hazy.
	18	18	29.653	80	74	74	S W by W	Light	...	Ditto.
	6th	9-30	29.776	76	73	86	S W by W	Light	...	Ditto.
	16	16	29.673	80	76	82	S W by W	Light	...	Ditto.
CUTTACK.	7th	9-30	29.763	76	74	90	W by S	Light	...	Foggy morning cumuli.
	18	18	29.626	79	75	82	S W by W	Light	...	
	1st	9-30	29.838	71	70	81	N E	Light	...	A few drops of rain with strong wind from N. E. at 1.4. W last night, cloudy horizon from N. E. to S. E. at sun rise, and still cloudy.
	2nd	16	29.805	79	72	69	W	Light	...	Cloudy.
	9-30	29.928	75	70	76	S E	Light	...	...	Fine.
	16	16	29.862	80	72	68	W	Light	...	Ditto.
	3rd	9-30	29.971	73	69	80	N E	Light	...	Ditto.
	16	16	29.867	81	70	55	W	Light	...	Ditto.
	4th	9-30	29.945	75	71	81	E	Light	...	Clear.
	18	18	29.830	81	76	78	W	Light	...	Ditto.
CUTTACK.	5th	9-30	29.856	75	73	90	N E	Light	...	Heavy dew last night, cloudy since morning.
	16	16	29.778	81	76	78	N W by W	Moderate	...	Cloudy.
	9-30	29.858	78	76	90	W	Light	...	...	Cirrocumuli.
	16	16	29.810	81	77	82	N E	Light	...	Fine.
	7th	9-30	29.865	79	76	86	W S W	Light	...	Cirrocumuli, little rain not measurable.
	18	18	29.803	80	75	78	W	Light	...	Cirrostrati.
	1st	9-30	29.870	80	63	34	N by W	Light	...	Clear misty horizon.
	16	16	29.790	80	65	29	W by N	Moderate	...	Sultry and hazy.
	2nd	9-30	30.019	78	70	65	E by N	Light	...	Fine.
	16	16	29.892	84	69	46	N W by N	Light	...	Thin cirri and misty.
CUTTACK.	3rd	9-30	30.037	79	71	65	S E by S	Light	...	Clear sky misty horizon.
	16	16	29.924	84	71	50	S	Light	...	Clear.
	4th	9-30	30.000	78	76	65	S	Light	...	Thin cirri and hazy.
	18	18	29.859	85	62	29	S E by E	Light	...	Ditto and sultry.
	5th	9-30	29.904	78	65	46	S by W	Light	...	Hazy.
	16	16	29.790	85	68	32	S by E	Light	...	Sultry misty horizon.
	6th	9-30	29.910	79	69	58	S by N	Light	...	Misty.
	18	18	29.894	83	72	53	S	Light	...	Cirrostrati to N. E. and S. W. misty horizon.
	7th	9-30	29.888	79	72	60	W by N	Light	...	Scattered cirri to S. E. and S. W. cirrostrati to N. E. and N. W., hazy.
	18	18	29.775	61	70	65	W	Heavy	...	Violent gale from W. lasted five minutes, unsteady wind, very severe lightning and thunder with slight rain measurable and covered with nimbi.

STATIONS.	Month.	Hour.	Barometer reduced to 32°.	Thermometer.		Humidity Sat. = 100.	Wind.		Rain.	WEATHER.
				Dry.	Wet.		Direction.	Velocity.		
MADRAS.			Inches.	⊖	⊖				Inches.	
	1st	10	29.806	87	87	30	S W	10°	...	Clear.
		16	29.769	93	71	29	E N E	8°	...	Fine with haze.
	2nd	10	29.934	87	73	43	S	8°	...	Hazy.
		16	29.811	84	76	07	E S E	12°	...	Clear.
	3rd	10	29.970	84	74	60	S by W	7°	...	Hazy.
		16	29.890	34	73	64	E S E	11°	...	Ditto.
	4th	10	29.971	84	73	68	E N E	8°	...	Clear.
		16	29.845	81	72	63	E by N	10°	...	Fine, with passing clouds.
	5th	10	29.912	82	68	45	S S W	6°	...	Fine, with light haze.
		16	29.773	84	71	50	E S E	11°	...	Clear.
	6th	10	29.899	84	72	53	S S W	12°	...	Ditto.
		16	29.764	84	75	64	S E	14°	...	Passing clouds.
	7th	10	29.801	88	77	64	S W	10°	...	Fine with light clouds.
		16	29.724	85	77	08	S E	15°	...	
DACCA.	1st	9-30	29.787	71	67	80	E S E	...	...	Light wind, Clear.
		16	29.676	75	68	68	E S E	...	...	Ditto ditto.
	2nd	9-30	29.878	74	61	72	E	...	...	Ditto ditto.
		16	29.791	77	70	68	W N W	...	...	Ditto ditto.
	3rd	9-30	29.925	75	71	81	S W	...	...	Ditto ditto.
		16	29.803	79	73	73	S W	...	...	Ditto ditto.
	4th	9-30	29.880	77	73	81	S W	...	...	Ditto ditto.
		16	29.740	81	75	74	S S W	...	...	Ditto ditto.
	5th	9-30	29.778	75	75	100	W S W	...	...	Ditto ditto.
		16	29.838	82	75	70	W S W	...	...	Ditto ditto.
	6th	9-30	29.793	79	74	77	N	...	...	Strong wind, clear.
		16	29.801	81	73	68	S W	...	...	Light wind ditto.
	7th	9-30	29.793	76	68	64	N E	...	...	Ditto ditto.
		16	29.671	77	71	73	W	...	...	Ditto Cloudy & drizzling
BENGAL.	1st	10	29.834	...	...	...	W	...	...	
		16	29.555	...	...	...	W	Light.	...	
	2nd	10	29.718	...	...	...	S E	...	...	
		16	29.628	...	...	...	Calm	...	...	
	3rd	10	29.732	...	...	...	S E	...	...	
		16	29.624	...	...	...	...	...	...	Strati.
	4th	10	29.740	...	...	...	W	...	...	Cirri strati.
		16	29.594	...	...	...	W	...	...	Cumuli, strati.
	5th	10	29.650	...	...	...	E	...	...	Cumuli strati, cirrostrati,
		16	29.512	...	...	...	S E	...	...	thunder lightning, slight rain at 9 p. m.
	6th	10	29.674	...	...	...	N W	...	...	
		16	29.615	...	...	...	W	...	...	
	7th	10	29.757	...	...	...	W	...	...	
		16	29.617	...	...	...	W	Light.	...	
ROORKEE.	1st	9-30	28.952	68	61	64	Calm	...	...	The weather to-day is warm and one feels as if the hot weather were coming on. Horizon all closed in with thick haze and dust. Sharp N. W., wind blowing all the afternoon.
		16	28.844	62	65	35	W	...	...	
	2nd	9-30	29.051	60	58	47	W	...	...	
		16	28.981	69	63	35	N W	...	...	Brisk N. W. wind nearly all day.
	3rd	9-30	29.111	66	62	31	W	...	...	
		16	29.065	73	61	20	N W	...	...	
	4th	9-30	29.003	63	61	61	W	...	...	Cumuli morning from S. W. to N. E. nimbi in S. E. sky clear at 22 hours.
		16	28.905	73	55	24	N W	...	...	
	5th	9-30	29.024	64	63	43	W	...	...	
		16	28.910	70	65	33	N W	...	...	
	6th	9-30	29.068	60	47	29	N W	...	...	
		16	28.984	68	49	14	N W	...	...	
	7th	9-30	29.031	63	61	87	W	...	...	
		16	28.900	70	59	35	W	...	...	
DARJEELING.	1st	9-30	23.218	63	46	54	E by N	Light	...	Clear, pleasant morning.
		16	23.188	57	49	52	W	Light	...	Scattered cumuli and very hazy horizon.
	2nd	9-30	23.313	56	8	61	E	Light	...	Clear.
		16	23.263	55	7	68	W S W	Light	...	Misty.
	3rd	9-30	23.818	60	7	78	S E	Light	...	Cumuli round horizon, rest clear.
		16	23.276	55	74	74	N W	Light	...	Misty.
	4th	9-30	23.298	54	80	80	S E	Light	...	Clear.
		16	23.217	64	47	47	S	Light	...	Ditto.
	5th	9-30	23.234	59	28	28	S	Light	...	Covered with cirri.
		16	23.177	63	5	5	S	Moderate	...	Cirro-cumuli, hazy horizon.
	6th	9-30	23.213	40	1	1	S	Light	0.2	Cirro-cumuli.
		16	23.165	54	1	1	S	Moderate	...	Nimbi cumuli, slight thunder and lightning.
	7th	9-30	23.154	47	...	...	S	Light	0.25	Cirro-cumuli.
		16	23.083	55	...	...	W	Light	0.02	Cumuli round horizon, rest clear, slight shower of hail at 10-30.
FARAKKA.	Feb. 23rd	9-30	29.887	81	...	...	S W	...	...	Strong breezes and fine.
		16	29.709	82	...	...	S W	...	...	Ditto weather and fine.
	24th	9-30	29.720	81	82	82	S W	...	...	Ditto ditto.
		16	29.635	83	78	78	S W	...	...	Strong breezes and fine.
	25th	9-30	29.638	78	69	69	N E	...	...	Ditto ditto.
		16	29.748	78	71	71	N E	...	...	Moderate breeze.
	26th	9-30	29.923	78	74	74	N E	...	...	Fresh breezes and fine.
		16	29.798	78	71	69	N E	...	...	Ditto weather.
	27th	9-30	29.953	79	69	64	N W	...	...	Light weather.
		16	29.808	78	68	67	E by S	...	...	Moderate breeze.
	28th	9-30	29.991	78	70	85	N N E	...	...	Light weather and fine.
		16	29.733	81	72	62	S	...	...	Ditto ditto.
	29th	9-30	29.808	78	67	63	S W	...	...	Ditto weather.
		16	29.689	80	75	79	S S E	...	...	Ditto ditto.

STATIONS.	February.	Hour.	Barometer reduced to 32°.	THERMOMETER.		Humidity Sat. = 100.	WIND.		Rain.	WEATHER.
				Dry.	Wet.		Direction.	Velocity.		
PATNA.			Inches.	⊖	⊖				Inches.	
	28th	0-30	29.757	60	58	47	W N W	...	...	} Calm and warmer.
		3-30	29.594	77	64	45	W N W	...	...	
	29th	0-30	29.673	72	62	53	S W	...	...	} Ditto ditto.
		3-30	29.610	76	67	60	W N W	...	...	
	March									
	1st	0-30	29.629	79	65	43	E	A.	...	} Warm with east wind.
		3-30	29.540	84	70	46	E	...	...	
	2nd	0-30	29.731	81	68	51	E	...	...	} Ditto ditto.
		3-30	29.637	85	74	57	E	...	...	
	3rd	0-30	29.757	80	68	51	E	...	...	} Ditto ditto.
		3-30	29.600	87	71	42	N N E	...	...	
	4th	0-30	29.717	82	69	45	W	...	...	} Rain gathering.
		3-30	29.585	90	60	30	N N W	...	...	
	5th	0-30	29.645	80	69	54	N W	...	...	} Windy all day.
		3-30	29.550	81	65	38	N E	...	...	

BENGAL SECRETARIAT,  
The 14th March 1868. }

HENRY F. BLANFORD,  
Meteorological Reporter to Govt. of Bengal.



SUPPLEMENT TO  
**The Calcutta Gazette.**

WEDNESDAY, MARCH 25, 1868.

OFFICIAL PAPERS.

*Non-Subscribers to the GAZETTE may receive the SUPPLEMENT separately on a payment of six Rupees per annum if delivered in Calcutta, or twelve Rupees if sent by Post.*

**Report on the Inundation of the Soane.**

From T. B. LANE, Esq., Officiating Secretary to the Board of Revenue, Lower Provinces, to the Secretary to the Government of Bengal,—(No. 43M., dated Fort William, the 14th February 1868.)

I AM directed to forward herewith, for the information of Government, a letter in original from the Commissioner of Patna, containing a full report from the District Engineer of Shahabad, on the subject of the late inundation of the Soane.

2. Mr. McNamara's report is very interesting, and may, as recommended by the Commissioner, suitably be published in the *Gazette* for general information. The greater portion of it calls for the earnest attention of the Public Works Department.

3. Paragraphs 10 to 13 will be taken into consideration in connection with a separate correspondence, in which the Board are now engaged, regarding the formation of a statistical agency.

4. The Board also desire me to request that copies of the Collector's report and enclosure may be sent them when printed.

From R. P. JENKINS, Esq., Officiating Commissioner of the Patna Division, to the Secretary to the Board of Revenue, Lower Provinces,—(No. 1155, dated Patna, the 5th February 1868.)

I HAVE the honor to forward a copy of a letter\* from the Collector of Shahabad, submitting a full and interesting report from the District Engineer on the late inundation of the Soane, which I beg to submit in original for the perusal of the Board and transmission to the Government. I would recommend that Mr. McNamara's report be published in the *Calcutta Gazette* for the information of the public.

From H. W. ALEXANDER, Esq., Collector of Shahabad, to the Commissioner of the Patna Division,—(No. 791, dated Arrah, the 3rd January 1868.)

I HAVE the honor to submit the information called for in your Circular No. 130, dated 6th September 1867, and No. 151, dated 10th October 1867, regarding the damage occasioned in this District by the late inundation of the Rivers Ganges and Soane.

2. I forward in original a very complete and intelligent report drawn out by Mr. McNamara, District Engineer, in regard to the flood of the Soane River, giving full information (1) as to the height of the flood; (2) the extent of country inundated; (3) the amount of damage occasioned. These points have been so fully detailed in Mr. McNamara's report that I have nothing to add to them.

3. From information received from the District Superintendent of Police, it seems that the damage caused to private property by the flood was as follows:—

*By the inundation of the Soane.*

Circle.			Number of houses.	Value estimated by the owners.		
				Rs.	As.	P.
Arrah	...	...	300	4,899	0	0
Koelwar	...	...	158	743	0	0
Sundais	...	...	22	430	0	0
Akberpore	...	...	2	158	0	0
Total			482	6,230	0	0

including the value of  
25 head of cattle  
destroyed.

*By the inundation of the Ganges.*

Circle.			Number of houses.	Value estimated approximately.	
				Rs.	
Burharra	...	...	3	32	
Peroo	...	...	1	10	
Sinha	...	...	48	970	
Total			52	1,012	

4. I am happy to be able to report that there was no loss to human life caused by either flood.

5. The damage occasioned to public property, including public buildings, district roads, roads, &c., within the Municipal limits, has been given in detail in the District Engineer's Report.

6. In paragraph 10 of his report Mr. McNamara has estimated the damage done to the Bhadye crop on the *silab* or low lands running along the side of the Ganges at 1,11,000 maunds, and this I take to be a very fair and correct estimate, for I deputed an intelligent Native subordinate from my office to hold a local enquiry in this matter, directing him to visit each village which had suffered, and to examine Putwaries and other village Amlah. His enquiries extended through eleven villages in Pergunnah Beheea, fifty-seven in Pergunnah Arrah, and twelve villages in Pergunnah Barragaman, in all eighty villages, in which the loss was estimated at Rupees 71,576 maunds. In other villages he was unable to obtain the requisite information from not meeting with those who could supply him with trustworthy returns, so that the above estimate is below the actual loss occasioned, and the District Engineer's calculation would appear therefore to be as correct a one as could well be made with the means at his disposal for acquiring information on this point.

7. Although this damage to the crops may appear at first sight to be a very serious one, it must not be overlooked that it is one which is more or less anticipated every year, as the lands near the river sown with this crop are always liable to be flooded, and are moreover sown with the full knowledge of this risk; should they escape a flood in any year a full harvest is reaped; should they be destroyed, the land is rendered by the flooding more rich and fertile for the ensuing Rubbee crop. No crops could look finer than do the Rubbee crops of all kinds now on the very lands which a few months ago were under water, so that in considering the loss that is occasioned to the Bhadye crop on the one hand, the gain on the other to the Rubbee must not be overlooked, the latter almost compensating for the former.

8. Mr. McNamara in his report has entered on other points of considerable interest and well worthy of consideration, such as the sufficiency or insufficiency of water-way along



the Railway line of embankment between the River Soane and Arrah; suggestions as to the best means for obtaining statistical information regarding the out-turn of crops, &c. The latter subject is at present I believe under consideration by Government; the former is a subject on which I do not feel I am called upon to give an opinion, but it is a matter of considerable importance and worthy the attention of those who are more intimately concerned in the matter. Should the informations contained in paragraphs 24, 25, 26 of the District Engineer's Report be quite correct in regard to the height to which the extraordinary flood of the year 1848 rose, it is a matter for serious consideration whether, if a similar flood occurs in any future year, the present water-way along the Railway line of embankment is sufficient to ensure the stability of existing bridges.

9. I regret extremely the delay that has occurred in the submission of this report; the District Engineer's report was, however, only received by me on the 31st ultimo, but I trust, however, that the completeness of the report may be deemed a sufficient excuse for its somewhat tardy submission.

10. The return of Mr. McNamara's report, together with the maps showing the country inundated, when no longer required, is requested.

From J. McNAMARA, Esq., District Engineer, Shahabad Roads, to H. W. ALEXANDER, Esq., Magistrate of Shahabad,—(No. 160, dated Arrah, the 31st December 1867.)

AGREEABLY to your letter No. 1219, dated the 22nd September last, I have the honor to submit the following notes on the flood of the Soane, which occurred on the 30th September 1864.

2. Anticipating the receipt of your letter of instructions, I proceeded at once to trace the limits of the flood along its south and western sides, and as soon as the subsidence of the water rendered it possible to ride and swim across the tract of country afflicted by the inundation, I traversed it throughout its length and breadth, particularly along the banks of the Soane, and noted minutely the places in Shahabad where the river overflowed. I then crossed into the Gaya District opposite Suhar, and worked similarly down the right bank of the river to Behta, in the Patna District, whence I returned on the 1st ultimo. I was induced to examine the right bank of the river in consequence of the difference of opinion that existed after the flood of 1861, as to whether the Soane is liable to spill in that direction. This question was referred to in paragraphs 22 and 23 of my report on the flood of 1864, published in the *Government Gazette* of the 23rd August 1865.

3. I submit herewith two maps, one on a scale of four miles to the inch, giving the course and extent of the flood; and the other on a scale of one inch to the mile, shewing in detail the river bank and the places along it in this District where the river overflowed. It will be seen that the Soane flood extended almost entirely over Pergunnahs Barrehgaon and Arrah, and over one-fourth of Ponwar and a fifth of Bheeah, covering in all an area of about 391 square miles.

4. The loss caused to public property is estimated as follows:—

	Rs.	As.	P.
Damage to District Roads as per detailed estimates annexed	...	5,413	0 0
Ditto to Station (Municipal) Roads as per ditto ditto	...	4,068	0 0
Destruction of Nowada latrine ditto ditto	...	600	0 0
Ditto of old Government Distillery	...	709	0 0
Total	...	10,781	0 0

5. It will, I trust, be deemed worthy of notice that the several Feeder\* Roads that

\* Chuprah and Arrah Feeder.  
Sinha and Arrah Feeder.  
Peero and Arrah Feeder.

† The principal of these is the bridge across the Gangay nuddoe [an old course of the Ganges] consisting of five spans of about 60 feet each, and masonry piers constructed on under-muck foundations through 25 feet of silt and 30 feet below low water level.

came under the full influence of the flood, and constructed of late years from the Local Funds under local management, comprising bridges of greater magnitude than any similar works in Bengal, have all stood the flood without injury. It will be remembered that the force of the flood at the gangey bridge presented a sight that was literally fearful to witness and attracted crowds of anxious spectators.

6. The loss to private property, by the destruction of native houses in the town of Arrah and the neighbouring villages, is very similar to that experienced in 1864; a detailed list of the damage has been prepared by the Police, and there is nothing I can add to it.

7. In accordance with the 4th paragraph of your letter of instructions, I took particular note of the injury sustained by the crops; and I am glad to say that excepting the low *sitab*, land north of the Buxar Road that had been previously injured by the overflow of the Ganges, the damage caused by the Soane is so slight and scattered as to be scarcely appreciable, and does not exceed 1,200 acres, the value of which may be estimated at Rupees 14,000. The overflow of the Soane—unlike that of the Ganges—goes off rapidly, and does little or no injury to the crops, save where it first breaks over the bank and sweeps away the



entire cultivation. This circumstance is worth noting in connection with the tradition that prevails, as to the water of the Soane being injurious to cultivation.

8. The damage to the Bhadye crop on the *silab* land between the Buxar and Arrah Road and the Ganges, occasioned by the combined floods of the Ganges and Soane, is considerably greater, and I estimate the loss in the manner shewn below at Rupees 1,11,090. No distress is apprehended from this loss, because the submergence of the *silab* land by the Ganges is a very ordinary occurrence, and the Bhadye crop is sown merely on the chance of its escaping a flood; and in the case of its being destroyed, the land is immediately re-sown with *Rubbee*. On the *silab* land this latter crop needs no irrigation, and the injury by flood to the Bhadye crop is compensated for by the increased fertility of the land, and the consequent benefit to the *Rubbee* crop, which forms the staple growth of these parts and is produced in great luxuriance.

My estimate of the loss sustained by the Bhadye crop will probably appear high, but I have gone over my figures carefully, and do not think the result is exaggerated. It will be seen from the District Superintendent of Police's Report on the flood of 1864 that no truthful estimate of the injury then occasioned to the crops could possibly be formed by the means at his disposal; and from my experience of the estimate formed in connection with the present flood, the remark applies equally. I have stated and shewn by example in a

\* Paragraph 2 of my letter No. 65 of the 7th February last.

former report\* that the ordinary mode of enquiry regarding the out-turn of crops is worse than useless, and likely to mislead; and I then designed and submitted a plan of statistics in the form of a tabulated statement which was meant to facilitate the collection of such information from Native Zemindars and cultivators in a manner easily intelligible and familiar to them, and admitting of considerable check. The subject has occupied my attention since November 1865, when I was requested by the Collector to gather information as to the state and probable out-turn of the *Aughunnee* crop; and I was encouraged to proceed with it by the Collector, Mr. Alexander, and by Messrs. Stevens and Gribble, the Sub-Divisional Officers of Buxar and Sasseram. In January 1867, I completed the statistical return alluded to; and the Collector in taking it as the basis whereon to found his replies to the questions connected therewith put by Mr. Cogkerell the late Famine Commissioner, made favourable mention of it in his report on the subject.

10. I have been induced to enter into the above explanation, as it bears on a proposition that I beg to submit for consideration; and which I believe will go a certain way to meet enquiry on the subject that has, I understand, been instituted by Government. It is not impossible that my labours, in connection with the practical working of the question, may have led from necessity to invention.

Pursuing a modification of the plan alluded to in paragraph 8, I annex a tabular statement of the amount of damage done to the Bhadye crop on the *silab* land between the Buxar and Arrah Road and the Ganges. It is easily ascertained that the culturable land that suffered by inundation is nearly as follows:—

Pergunnahs Arrah and Barrehgaon	...	...	140,000 acres.
„ Beheeah	...	...	37,000 „
„ Bhojpore	...	...	60,000 „
Total	...	...	23,700 „

Of this quantity, the proportion under cultivation is found from enquiry to have been about  $1\frac{1}{2}$  annas (sixteenths) or 22,218 acres, of which 10 annas or 13,886 $\frac{1}{2}$  acres, and 6 annas or 8,331 $\frac{1}{2}$  acres were respectively lost and saved. The yield per acre is taken at 8 *pucca* maunds, valued on the average at 1 rupee a maund; so the entire loss may be estimated at  $13,886\frac{1}{2} \times 8 \times 1 \text{ rupee} = 1,11,090 \text{ Rupees}$ .

11. In ascertaining the out-turn or the loss occasioned to crops, or the sufficiency or otherwise of the food staples for the inhabitants of a District, actual measurements are out of the question. And landholders and cultivators have not, as a rule, the capacity to realize questions of this nature that are put to them in a concrete form: information can only be elicited from them in a shape with which they are familiar. Every cultivator is aware of the prospects of the crops in his village, and most of them can form a fair estimate of the different annas or proportions in which the several crops are sown, and of the annas or proportion they bear to a full yield. Could this information be applied to the statistical data regarding culturable area and population that we possess, an approximation sufficiently accurate for the purpose and useful in the extreme might be arrived at. This, however, must be patent to all, and the facts are nothing new. How is the required information to be collected from each village? Where is the establishment to be found that could be entrusted with the work? The answers to these questions constitute the main features of the proposal above referred to, and which I beg most respectfully to submit for consideration.

12. The subordinate establishment of the Opium Department is the agency whose aid I would recommend to be enlisted for the work. The subordinates are distributed over the length and breadth of the District (and equally so over the entire Patna Division,) and are closely

connected with the agricultural classes from whom the required information is proposed to be elicited. Poppy is grown throughout Shahabad. Every cluster of few villages has its *Kottadars*; these are grouped under *Zilladars*, who again are distributed under the control of *Gomashtas* in charge of Kotees most conveniently situated over the District, *viz.*, at Arrah, Garhiney, Shahpoor, Dhungai, Bhojpore, Chowsah, Bhubbooah, and Sasseram. A better establishment and a better distribution could not be wished for. The men comprising it, apart from the interest they naturally take in agricultural matters, are obliged from the nature of their duties to visit the lands of the several villages during their inspections and measurements of the poppy cultivation. They cannot help being thoroughly conversant with the state of the crops; and, described in the proportions of a rupee or *annas*, the subject forms their most interesting topic of conversation. The more closely I have considered the matter, the more feasible does it appear. During the months of September and January, the *Gomashtas*, *Zilladars*, and *Kottadars* assemble at Arrah for their first and second advances, and again in March and April they attend for the weighments: the time could not be better arranged with reference to the *Bhadga*, *Aughunnee*, and *Rubbee* crops. The men necessarily spend hours and days at the Sub-Deputy Agent's Office, waiting to be called up in turn. Here is an opportunity to explain to them, during their leisure hours, the object of the enquiries which it is proposed to make, and to enlist the interest of the *Kottadars* and *Zilladars*, in a subject that their experience of the distress that lately prevailed throughout the District will bring home to them; to instruct the *Gomashtas* regarding the tabulated form in which the required information is to be compiled, and to check and control the proper working of the whole. Those of the subordinates to whom I spoke on the subject have quite understood and appreciated the object of the enquiries which it is proposed to make; and my experience in compiling the tabulated statement referred to above enables me to say with confidence that

\* Last year my own *Gomashtas* prepared the returns with ease and readiness.

there will be no great difficulty in getting the *Gomashtas* to submit somewhat similar statements\* containing the required information. These again will require to be checked and condensed into a convenient shape something in the form of the tabular statement submitted with my letter\*; and it remains to see how this can be done. Of course the Collector would be immediately responsible for the preparation and general accuracy of the return, but he would need assistance. His Office Establishment could not at first be trusted to do the work, and, as a rule, he himself has not the time nor the practice to work out the necessary calculations and details. He would require the assistance of one who was familiar with figures, and practised in forms and classification; and it is not unlikely that Officers with the needful capacity and aptitude, and who could undertake the duty, may be found in the Division. As regards Shahabad, I should be glad of the opportunity to re-cast, and to bring the statistical return already prepared up to the degree of accuracy that I perceive to be possible. Once this is done carefully, the work of the succeeding years will be greatly simplified.

13. Some difficulty may arise from the fear that the work proposed for the opium subordinates will interfere with their more legitimate duties, but I do not think that such objection can really exist; and apart from the fact of the Collector being also ex-officio Deputy Opium Agent, and difficulty between the respective offices, would imply a want of tact and consideration that it is premature to apprehend.

14. In describing the late flood it may be useful to collect together the details relating to the river, however common and well known they may be. It will be seen from the "Map of the drainage Basin of the Soane" attached to Colonel Dickens' "Canal Project," that the "river rises along with the Nerbudda and Mahanuddee, on the elevated plateau of Central India, near Ummurkuntuk, and 325 miles through a high rocky tract," before it shews in more civilized parts, and enters the valley of the Ganges in Shahabad. The area of the country which drains into the Soane is immense, being "nearly 23,000 square miles. Its tributaries all flow from the south, and comprise the rivers Koel, Kunhur, Rehund, Bijul, Goput, and Banas. On the north the drainage area is limited to the steep slopes and precipices of the Kymore range, along which the river runs; so that the opinion partially entertained at Arrah, as to the river being affected by rain-fall on the portion of the Kymore range in Shahabad, is altogether erroneous. The drainage of this part flows away from the Soane, towards the north, and gives rise to the Kao, the Koodra, the Doergowty, the Sora, the Kora, the Gonhooah and the Karrumnassa Nuddees, all of which flow through Shahabad, and occasion floods, perhaps as extensive, and certainly more devastating, than that of the Soane. For eight months in the year the greater part of the river in its course through Shahabad is dry. To the spectator standing near the middle, amidst the glare and refraction of a hot day, the prospect assumes the appearance of a narrow channel bounded on either side by a vast sandy desert, nor is it improbable that a mirage might be seen to complete the illusion. Sudden is the change to which the river is liable. A few days of continuous rain on the great central plateau—in the course of a few hours, oftentimes in the darkness of a single night—and the river bursts into the valley of the Ganges in all its might and grandeur.

15. Such was the case with the present flood. On the evening of Thursday, the 19th, the river in the neighbourhood of Arrah was lower than its ordinary low water level. During

the night it rose some thirteen feet, and overflowed the bank so rapidly, that on Friday morning, before intimation of the flood could be brought to the station, the water made its appearance, washed down the Sudder Distillery, and inundated the town and station.

16. At 6 o'clock in the morning, as we rode through the town, there was not the slightest symptom of the flood, nor did the Gangey nuddee shew any unusual rise; by 8 o'clock the water, it seems, appeared on the outskirts of the town; by 8½ o'clock the Sudder Distillery was washed down; and immediately afterwards the flood poured in from the direction of the Chutpokur bridge, Moteetolah, and the village of Eniyet, and spread over the place with astonishing rapidity.

By noon a great part of the town was submerged, principally in Mohullahs Mahadewah, Nowadah, Averpool, Sheikwully Musjil, and Kurnmutolah; the lanes leading through the town were from two to three feet under water; and many of the *kutcha* houses were washed down. The main street passing the Jain, from the Charitable Dispensary to the cross roads south of the *Thannah*, presented the appearance of a navigable channel along which the water flowed with marked velocity at a depth of about two and a half feet. Great excitement prevailed throughout the city, and to some extent in the station. The public offices were closed; all ordinary business was stopped; and the flood, and the precautions necessary to take against it, occupied universal attention.

The Railway Station was a point of attraction to most of the officials and European residents, of whom, scarcely one of the former, strange to say, had been long enough in the place to witness the flood of 1864. As far as the eye could reach, the country along the line was completely submerged, and presented the appearance of a vast sheet of angry water. Early in the day, notice of the flood had been telegraphed to the Railway Officers at Dinapore and Beheesh. Reports came in that the embankments that had been thrown up after the flood of 1864 to protect the Railway bridges from injury were being washed away. The slopes of the bank itself were being slightly cut away in places; and as the flood continued to rise, fears were very generally entertained that in case the flood was of long continuance, these injuries might increase, and affect the safety of the line. Remedial measures were promptly applied by Messrs. Thomson and Fox, who lost no time in bringing their ballast train, laden with railway chairs, to bear on the bridges that were being injured, and so to fill in the encroachments that were forming behind the wingwalls of the bridges. Fortunately, however, the inundation had now (2 o'clock P. M.) almost reached its maximum, and it remained stationary until 11 o'clock P. M., when it commenced to fall steadily. It was known that between the morning and the evening the water had lowered one foot on the gauge at the Soane bridge; also it was believed that the river had subsided to within its banks, so by nightfall confidence was in a measure restored; but in case the river should rise again, perhaps higher still as it did in 1864, each Railway bridge was carefully guarded and watched during the night. But the river continued to fall rapidly, and the flood had past.

18. As was the case with the previous inundation, the view along the line of Railway presented a panorama, which, for grandeur of scene and the practical study of the question, can rarely be equalled. Each bridge was a mark whereon the fury of the waters seemed to concentrate with accumulating force, and formed a stream which, as it dashed tumultuously through the bridge, shot away from the surrounding water with an accelerated speed. The highest clear afflux, i. e., the difference between the level of the water above and below a bridge was 24 inches within one inch of that of 1864; and the corresponding velocity was 11½ feet per second. Since the flood of 1864 the bridges on this portion of the line have been cleared out down to the inverts, and securely protected below, at a cost of about a lakh and a half of rupees; and in the case of the Nugree, the Syur, and the Jummeerah bridges, the waterway has so far been undoubtedly increased, because the bottoms of these bridges, which previously stood above the beds of their respective nuddees, have now been considerably lowered, and allow free play to the water. But the experience of the late flood, short though it was in its duration, shews that the increased waterway is scarcely appreciable; and, however impregnable the bridges have been rendered, an element of weakness remains in the fact of the erosion to which the slopes behind the wingwalls are liable. The embankments that were thrown out after the flood of 1864 on the upper side of the bridges to protect these slopes, originated doubtless in the desire to utilize the earth that was removed from the bottom of the bridges, and so far they have answered admirably; but, as was to be expected, some of them were washed away; and protection of a more permanent nature is perhaps advisable. This, however, is a subject on which it is unnecessary for me to enlarge. After the flood of 1864, Mr. Power made a personal inspection of the several bridges that were affected by it, and the necessary precautions, so far as the circumstances appeared to require, were of course adopted. I only venture, with much diffidence and respect, to submit for consideration those circumstances connected with the late flood that my presence on the spot enabled me to observe; and should these tend to shew that increased waterway is needed, the cost of the protective measures that may be deduced from the experience of each successive flood will be saved, and the first expenditure, however large, will in the end be the safest and most economical. The highest flood rise of the Soane seems to be involved in some obscurity, for if I remember rightly the amount of waterway that was determined originally



for the section of the line under remark, has fallen considerably short of the requirements that have since appeared necessary. It may therefore be useful to describe the effect and extent of the flood on the left bank of the river across the Railway; also the spill across the right bank in connection with the new road from Baroon to Behia; and to note and compare the several heights to which the greatest floods of the Soane are known to have attained.

19. Proceeding up the left bank of the river\* from the Soane bridges at Koelwar,

\* See detailed Map No. 2.

the first spill occurs at about 600 yards above the bridge and between it and Dundeeah (outside the Railway Company's land) through a breach, about 80 yards in length, in the embankment constructed by the Company; and again, just below Dundeeah two similar breaches occur, about 140 yards in length. At Dundeeah the course and action of the river are deserving of attention. To this point, from Nansagur, distant about 8 miles, the river flows through a series of long reaches, on the concave bends of which the current impinges with great force, so much so, that in places the bank is being cut away, and the river has a tendency to encroach on the Shahabad side. Reference to paragraph 3 of my last report will shew how this circumstance tends to increase the overflow across Shahabad, and I shall have occasion presently to add to my previous remarks on the subject. Immediately south of Dundeeah the river just overtopped the bank, and also opposite Kurrungpore, where it breached the road that adjoins in two places; but in either case the spill was comparatively trifling.

I. Under the head of a *talook*, marked *Rampore* on the Map, between miles IV. and V.,

Miles IV. and V. of detailed Map.

are two villages, Kurza and Behayarrah. About four hundred yards above the latter village, is the site of one of the two places where the river principally overflows. Here is the valley referred to in paragraph 3 of my last report that strikes out at right angles from the river, and leads into the Siyarrab Nullah, under the Railway between Jummeerah and Arrah. The Soane flows along an elevated ridge, and the country shews a steady fall of about  $2\frac{1}{2}$  feet in the mile direction of the Ganges. In places, on the margin of the river, the descent is more rapid, so that as the river encroaches on the land in the manner noticed after the flood of 1864, a lower level is attained, and the overflow of the river is proportionately increased. During the flood of 1864, at the spot where the valley emerges from the river, the bank was cut away to the extent of 150 yards, and this year the injury has increased.

II. There can be little doubt that the encroachment is of long continuance and extensive, so much so as to have produced a marked alteration in the course of the stream. Referring to the detailed Map and its marginal sketch annexed hereto, it will be seen that at this place, not only an extensive sand bank previously existed on the Shahabad side of the river, but there was considerable space, some 200 yards, between the river bank and the road that ran nearly parallel with it. Now the deep channel of the river has taken the place of the sand bank; the stream has so encroached on the land as to cut away the road; and the overflow rivals that of the much dreaded Tirkowl and Sundais spill, the fear of which after the flood of 1848 was so great that the local authorities resolved to *bind* the river in its vicinity, as described in paragraphs 5 and 21 of my last report.

III. Without intending to propose any place of embankments that would interfere with the natural course of the river, I may mention that the objections that exist with reference to the Tirkowl and Sundais *bind* do not apply to the overflow at Behayarrah. At the latter place, an increased overflow has resulted from the encroachment of the river and from the destruction of the bank which previously acted as a barrier between the river and the adjoining country; and the construction of an embankment that would remedy this evil might be advisable. It would not require to be much more than a mile in length, and its ends could be made to fit into masonry *shaes*, so as to protect them from the action of the water that might work round them. It might also be advisable to check the tendency which the river has to further encroachment, by throwing out a spur that would induce the reformation of a sandbank on the Shahabad side, and turn the river to its former course; and only that the contingency is a most remote one, the possible harm which the proximity of the encroachment to the Soane bridge might entail, would invest the remedial measures with a much greater importance than they would otherwise possess.

IV. Midway between Khungaon and Bishunpore the river broke over the bank with

Miles VI. and VII.

considerable force, and carried a four hundred maund boat that was laden with salt for Nassrygunge, some three hundred yards across country and over the road, into a young mango tope, where it settled without much injury.

V. Between Bishunpore and Ackgaon, miles VII. and VIII., and again at Narainpore between miles IX. and X., the river just topped the bank here and there for a length in each case of about a quarter of a mile, but without doing much injury, save to the road which it scoured to a foot in depth.

VI. To Nansagur, miles X and XI., the country was unaffected by the flood.

VII. Just above Nansagur the river slightly overtopped the bank, and signs of the flood extend to Raypcorah, but to comparatively small extent.

VIII. From Raypcorah to Tirkowl is the strip of low land, or valley, which it was proposed to embank; and this gives origin to the well known Kirkowl *bind*, which however was never completed. The overflow here was perhaps even greater than that at Behayarrah (already described), and destroyed a rich crop of Jenara, Bajra and Kodon that stood (over a quarter mile square) between the land and the river. The valley is strewn with jungle wood,

amounting to about 5,000 maunds, brought down by the flood. The damage to houses along the river bank, throughout the course of the flood, has been remarkably slight; and the sites of the villages appear to have been selected with reference to a higher\* flood than any of those that have yet been recorded.

\* This remark applies equally to the town of Arrah, where the circumstance is very marked.

IX. From Sundais to Nonore, between miles XIV. and XXII., the overflows, where they occurred, in places here and there, were merely local, and flowed mostly along the Soane road, which is hollow from long wear and tear, and about eighteen inches below the level of the country. Beyond Nonore the flood is not worth noticing.

20. Leaving the left bank of the river I crossed to Suhar to ascertain, while the marks of the flood were still visible, whether the river was liable to overflow to any extent along its right bank. It will be remembered that this point was mooted during the flood of 1864, and was referred to in paragraphs 22 and 23 of my report.

My inspection enables me to shew beyond doubt that from Mussowrah downwards, the river spills extensively across the bank; though the line of new road alluded to in the report did little or nothing to prevent the free escape of the flood, for where the section was not too low to provoke the overflow and so to allow it to pass quietly away, the water cut through the road and made passages for itself, as will appear from my notes of inspection appended hereto.

21. The late flood affords an excellent opportunity to define the waterway required for the Baroon and Behta road alluded to above, and it would be pity if the present cold season is allowed to pass before the necessary details are collected. In its present state the road is of very doubtful utility, for while it has arisen above the simplicity and corresponding advantages of the old fair-weather line, it fails to surmount the obstacle it has provoked, and the flood has so breached and scoured it as oftentimes to render the route almost impracticable. The road is a local one, but under construction by the Department Public Works. Apparently it is intended to connect the Grand Trunk Road and the country in that direction with the Railway at Behta; and the demand for such a communication must soon increase, as the Soane Irrigation works at Deherree are proceeded with. It is evident from the effects of the late flood that the bridging of the last eight or nine miles [between Kunpah and Behta] will be a work of great expense; and it is to be regretted that road was undertaken without consulting the local Officers, whose experience of the country might have afforded useful information on the subject. The circumstance affords an instance of the anomalous and irregular working of the Local Funds; for the Rupees 10,000, that were taken this year from the General Fund Assignments of Shahabad, to be devoted to the Baroon and Behta road, would have sufficed to complete the line then under construction from the Railway at Arrah to Suhar, whence there is a paralld road along the left bank of the Soane to Deherree, opposite Baroon. The Rupees 10,000 could go no way to improve the former, whereas it would have sufficed amply to complete the latter, which traverses a line of country proved to be well above flood level, is free from local obstacles, and answers all the required purposes.

22. To allow of an approximation, however crude, of the area of the overflow of the Soane, I had a rough section taken of the valley at Beheyarrah. The sectional area so affected amounts to about 23,000 square feet, and the hydraulic mean depth is five feet. The fall in the country along the Nuggree Nullah is two feet in the mile nearly; and adopting Eytelwein's formula where  $v$  = velocity,  $f$  = fall of country per mile in feet, and  $d$  = hydraulic mean depth,  $v = 1.49 \sqrt{2fd} = 4.024$ , or a velocity of four feet per second, which gives a discharge of 92,000 feet per second. A like quantity may be assumed for the discharge at Tirkowl, and the same for the sum of the several minor overflows, equal  $92,000 \times 3 = 2,76,000$  feet per second, being the total discharge of the flood across Shahabad. It will be seen from paragraph 15 of my last report that the area of the waterway under the Railway that was similarly affected by the flood of 1864 amounts to 24,266 square feet; and applying to this the highest afflux of the late flood, viz., 24 inches, and the corresponding velocity of  $11\frac{1}{2}$  feet per second, the total discharge per second is found to be 0,75,014 feet, which agrees\* very nearly with that found above.

\* This agreement is only a coincidence, for the figures are taken roughly, and meant chiefly to shew the proportions of the several spills.

23. If the floods of 1864 and 1867 could be depended on as being the greatest force that is likely to be brought to bear against the Railway, there would be nothing to apprehend in regard to insufficient waterway; but my enquiries on the subject enable me to shew that the Soane is liable to a much greater overflow than those that have been recorded since the commencement of the Railway; and the highest rise of "25 feet" shewn [interrogatively] in page 8 of Colonel Dickens' "Canal Project", and referred to in paragraph 17 of my last report, is no longer as improbable as it appeared.

24. In 1848 Dr. Hooker travelled up the Soane valley into Mirzapore. At page 40 of his "Himalayan Journal," Vol. 1, published shortly afterwards, he refers to the Akberpore encamping ground, as follows:—"At the foot of the crowned spur is the village of Akberpore, where we encamped in a mango tope; it occupies some pretty undulating fine stone hills, amongst which several streams flow from the amphitheatre to the Soane." And he adds in a

\* "During our two days' stay here I had the advantage of the society of Mr. C. E. Davies, who was our guide during some rambles in the neighbourhood, and to whose experience, founded on the best habits of observation, I am indebted for much information."

DR. HOOKER.  
"Himalayan Journal."

foot note, bearing reference to the mango tope just mentioned. "On the 24th June 1848 the Soane rose to an unprecedented height and laid this grove of mangos three feet under water." The flood occurred shortly after Dr. Hooker's departure, and the information regarding it was supplied at the time of the occurrence by Mr. Charles Davies,\* of Akberpore, who witnessed it.

The mango tope still forms the encamping ground of the place; indeed, there is scarcely any other available in the neighbourhood; and at this moment it holds the encampment of the Commissioner and the officials of the District. The overflow of the Soane is stated to have risen to a height of three feet in this tope; but to avoid any error that might be expected from a general description, I have gone carefully over the ground with Mr. Davies, and he has pointed out to me to a nicety the height to which the water attained on one of the walks in the garden attached to the factory bungalow which adjoins. Here we arrive at clear and definite information; and I would recommend that the spot be marked by a stone-pillar shewing the height of the flood; or better still, if the pillar be so constructed as to shew respectively the heights of the floods of 1848, 1864, and 1867, each of which has been noted by Mr. Davies.

26. I have carefully levelled from the spot in the garden indicating the flood rise of 1848, to the highest flood levels of 1864 and 1867 as noted by Mr. Davies on the south-east corner of the fencing round his house; and I find that the rise of 1848 was 3.48 (3 decimal 48) feet higher than the extraordinary flood of 1864, which latter was 4½ inches higher than the rise of 1867.

27. The flood of 1864 attained the height of 20 feet 7 inches on the gauge at the Soane bridge, and the overflow across the Railway was the greatest on record and attracted considerable attention. The corresponding rise this year was even higher, viz., 21 feet, but the overflow and the flood generally were slightly less, the excess rise at the Soane bridge being accounted for by the swollen condition of the Ganges. Had the flood of the Soane been a week earlier, we should have experienced the simultaneous flooding of the Soane and the Ganges; but as it was, the Ganges fortunately had fallen about 8 feet when the waters of the Soane came down, so that the latter were not more *peened back* than the excess just alluded to.

28. It may be interesting to describe the flood in its course through Shahabad. From Akberpore Mr. Charles Davies writes:—"The Soane commenced rising here about 2 A. M. on the 19th September; reached maximum near 11 P. M. of the same day; remained stationary for nearly an hour, then gradually falling; had subsided within its banks by 5 P. M. of the 20th September. With exception of the Serhu rice of four or five Mouzahs in this Pergunnah, not much injury has ensued; the Dehri concern, however, has lost much indigo. The greatest amount of destruction has occurred between Kadhwan and Soupura (in Behar) above the embouchure of the Koel."

II. At Deherree 23 miles lower down the river the Register of the gauge kept by Mr. Long, the Engineer in charge of the Soane Irrigation Works, shews the following results,

19th September, 6 A. M.	...	307.84
19th " 9 "	...	309.84
19th " 12 "	...	312.64
19th " 3 P. M.	...	313.84
19th " 6 "	...	314.34
20th " 6 A. M.	...	314.84
20th " 9 "	...	314.51
20th " 12 "	...	312.84
20th " 3 P. M.	...	312.34
20th " 6 "	...	312.34
21st " 6 A. M.	...	309.59
21st " 9 "	...	309.51
21st " 12 "	...	309.34
21st " 3 P. M.	...	309.09
21st " 6 "	...	309.09

On the morning of the 18th, the river was at its ordinary level; in the course of the day it rose very little, only 1½ feet and continued to increase at the same rate during the night. On Thursday, the 19th, the rise was more rapid and soon attained the magnitude of a high flood. Up to 9 A. M. the river rose at the rate of two-thirds of a foot an hour; then to 12 A. M., at the rate of one foot an hour; and then to 6 P. M., at the rate of five inches an hour; having risen in all 6½ feet in the course of the day. On Friday, the 20th, the river (having continued in high flood all night) attained its greatest height, being 6 inches in excess of that of the previous evening. It remained very nearly up to this level for three hours or up to 9 A. M., after which it commenced to fall rapidly, and subsided to within its banks by 12 o'clock.

III. At Koelwar (the Soane bridge), 67 miles from Deherree, the river was at its ordinary level on the evening of the 19th—

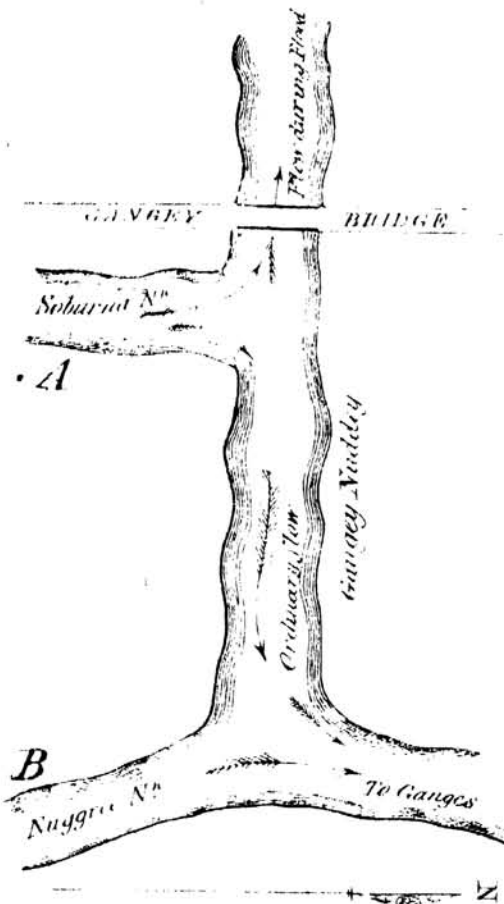
	Ft.	In.
On Friday, the 20th, at 4 A. M., it had risen	...	20 0
" Ditto ditto at 8 A. M., ditto	...	21 0
After which it began to fall, and at 11 A. M. it was	...	20 9
And by evening it fell to	...	20 0
The flood subsided rapidly during the night, and on Saturday morning the water stood on the gauge as low as	...	16½ 0

IV. At the Gangey bridge at Arrah, on Friday, the 20th in the early morning, the Nuddee stood at

At 5 A. M., it rose 7 feet and attained	...	5 8½
" 10 " " 1 foot 6 inches and attained	...	12 9½
" 12 " " 2 feet 1 inch	...	14 2½
" 2 P. M. " 6 inches	...	16 3½
" 4 " " 2 "	...	16 9½
" 6 " " 1 inch	...	16 11½
" " " "	...	17 0½

and remained at this height until 12 o'clock at night, when it began to fall rapidly. On Saturday morning altered to its natural course, eastwards towards the Ganges.





"Civil Engineering," Weales' Series, page 153.

29. The alteration which occurs in the flow of the Gangey Nuddee during high floods is worthy of record. The Nuddee receives a tributary A., just below the bridge, and another B., two miles lower down, where the stream turns to the north, directly towards the Ganges. During high floods, the volume of water brought down by the lower affluent is so greatly in excess of the discharging capacity of the main channel, that the water is penned back, as in the case of the Mississippi and Ohio; and the direction of the flow of the Nuddee is actually reversed, in the same manner probably, that the Arve, when swollen by freshets, drives back the waters of the Rhine as far as the lake of Geneva." The upper affluent A. adds to the flow of the reversed current which attains a velocity of about 9 feet per second. The Nuddee flowed in this manner from 9 A. M. of the 20th, until the morning of the 21st, when it changed to its natural course.

As I am on the subject, it may not be out of place to mention a remarkable instance, quoted from memory, for which I am indebted to Mr. Charles Davies of Akberpore, of the penning back of the water of the Soane, as observed by Colonel Dickens, when taking levels, many years ago, for his Soane Canal Project. At Bando Ghaut, two miles below the embouchure of the Koel, the Soane is comparatively narrow, and confined on the right by the high land of Kubrah, and on the left by the Oollee hill; and on the occasion of a flood, Colonel Dickens observed a deviation, as great as 17 feet, from the ordinary levels of the river, between Teleup and Bando, a distance of twenty-six miles. It is not improbable, that where the Soane receives the larger of its affluents all in high flood, a series of terraces are occasioned by the penning back of the water; and this theory would go a certain way to account for the traditions that are current along its course as to the sudden and overwhelming nature of the floods to which the river is occasionally liable.

31. I have shown in paragraph 27 now, though the flood level of 1867 was higher at the Soane bridge than the rise of 1864, yet that the flood itself was generally less. The difference is considerable and as follows:—

At Gauge at Soane bridge flood of 1867 was 5 inches higher than that of 1864.

At Gangey bridge, Arrah, and in the town itself the flood was 6 inches lower.

At Deherce, as observed by Mr. Daunt, who tallies with Mr. Long, the Engineer of the Soane Irrigation Works, the flood was 6 inches lower.

At Akberpore as noted (roughly) on the fencing round his house 4½ inches lower.

32. It was pointed out to me by Mr. Long that a stone tablet, fixed into the causeway at Deherce by the Department Public Works to mark the flood of 1864 makes the rise one foot higher than the late flood: perhaps it would be advisable to remove this tablet.

The Gauge at the Soane bridge is divided into fourths of a foot, which, owing to their distance from the observer, appear like inches; and at night I have seen endeavours made to read them by suspending a bull's-eye lantern over the pier with a rope, which, as it twisted around, rendered the operation liable to error. As it was the first intimation of the late overflow was communicated I believe from Arrah; and in a case where protective measures are required to follow so rapidly on the appearance of a flood, it might be advisable to make the Gauge more generally accurate and accessible.

In conclusion I venture to hope that the delay that has occurred in the submission of this report will be accounted for by the details now submitted, which I have only been enabled to complete within the last few days, since I accompanied the Commissioner and yourself up the valley of the Soane.

# SHAHABAD.

Tabulated Statistical Statement shewing the out-turn of the Bhadai crop, and the loss occasioned by the recent floods of the Seine and Ganges in September 1867 on the Khadir land, between the Arrah and Barah Road and the Ganges, in the District of Shahabad.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
Pergunnahs.	Culturable land of each Pergunnah in acres.	Proportion of land sown with Bhadai, being one-half-sixteenths of column 2.	BHADAI CROP.			JANERAH OR MAKAI FOUR-SIXTEENTHS.			TAGUN, SAWA AND MURWA THREE-SIXTEENTHS.			CHEENA AND KODYER SIX-SIXTEENTHS.			SARHA, SAUTTER AND GANDER DHAN THREE-SIXTEENTHS.		
			Produce of the entire Bhadai crops, at 8 mounds per acre.	Loss caused by the floods being ten-sixteenths of column 4.	Quantity saved being six-sixteenths of column 4.	Loss caused by the flood.	Quantity produced.	Total.	Loss caused by the flood.	Quantity produced.	Total.	Loss caused by the flood.	Quantity produced.	Total.	Loss caused by the flood.	Quantity produced.	Total.
			...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
			...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
			...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Arrah and Barreghaon ...	1,40,000	13,125	1,05,000	65,625	39,375	16,406	9,843	26,250	12,304	7,382	19,687	24,609	14,765	39,375	12,304	7,382	19,687
Bebeerah ...	37,000	3,468	27,744	17,310	10,404	4,335	2,601	6,936	3,231	1,950	5,202	6,502	3,901	10,404	3,251	1,950	5,202
Bhojipore ...	60,000	5,625	45,000	28,125	16,875	7,031	4,218	11,250	5,273	3,164	8,437	10,546	6,328	16,875	5,273	3,164	8,437
Total ...	2,37,000	22,218	1,77,744	1,11,090	65,654	27,772	16,662	41,436	20,828	12,496	33,326	41,657	24,994	66,654	20,828	12,496	33,326

ARRAH, }  
The 16th November 1867.

J. McNAMARA,  
District Engineer, Shahabad Roads.

**Correspondence connected with a complaint preferred by the Calcutta Trades' Association that the operations of the Calcutta School Book Society which receives a grant-in-aid from Government, interfere with private Trade.**

From J. LINDLEY, Esq., Secretary, Calcutta Trades' Association, to the Under-Secretary to the Government of Bengal,—(dated Trades' Rooms, the 17th September 1867.)

I HAVE the honor herewith to forward copy of a correspondence relative to the grant-in-aid to the Calcutta School Book Society, and shall feel obliged if you will lay the same before His Honor the Lieutenant-Governor at your early convenience.

From J. LINDLEY, Esq., Secretary, Calcutta Trades' Association, to the Secretary to the Government of Bengal,—(dated Trades' Rooms, the September 1867.)

I AM instructed by the Master and Committee of the Calcutta Trades' Association to draw the attention of His Honor the Lieutenant-Governor to a correspondence, (copy of which is herewith annexed,) with reference to the grant-in-aid allowed to the Calcutta School Book and Vernacular Literature Society. In October 1864 the Association addressed a

- (a.) Memorial dated 12th September 1864.
- (b.) Letter dated 6th October 1864.
- (c.) Letter dated 10th February 1866.
- (d.) Letter dated 10th January 1865.

memorial (a.) to His Excellency the Governor General on the subject, which memorial was transferred to the Government of Bengal (b.) for disposal. In February 1865 the Association was informed (c.) that the Lieutenant-Governor reserved his opinion until he had been able to refer to a Report of the School Book Society then in the press; at the same time copy of a letter (d.) from the Director of Public Instruction, to the Junior Secretary to the Government of Bengal, was forwarded to the Association for information. In March 1866 the Association asked the Lieutenant-Governor (e.) for an expression of his opinion on the subject, and was informed (f.) that he still reserved his opinion until able to refer to the Report of the Society for 1865, then supposed to be nearly ready for issue. 'This Report has been

for many months before the public, but His Honor's opinion has not yet been made known. The Association, therefore, beg to bring the question before His Honor the present Lieutenant-Governor, and, in doing so, would add a few words to the memorial of 1864, and in reply to the letter from the Calcutta School Book Society to the Director of Public Instruction, inasmuch as the Association cannot agree with him in thinking that "the Society's answer completely disposes of the allegations contained in the memorial."

In Mr. Atkinson's letter (D.) it is stated that the Calcutta Tradesmen "represent that the low prices at which the Calcutta School Book and Vernacular Literature Society sell their books interfere with private enterprise," &c. A reference to the original memorial, paragraph 10, will shew that no such representation was made; on the contrary, it is distinctly stated that the Association does not wish to interfere with the sale of the books of the Calcutta School Book and Vernacular Literature Society.

The Association is of opinion that, in paragraph 5 of the Society's letter, a statement is made, amounting to a confession, that the allegations of the Trades' Association are correct, inasmuch as it is there stated that the grant of public money enables them to "defray the expense of conveying books to the interior of districts with all attendant risks and losses," a privilege which is not at the disposal of the regular trader. With reference to the paragraph under notice, the Association finds from the Report of the Society for 1863 that the Government grant to the School Book Society's Department alone (with interest on Government Securities) amounts to the sum of Rupees 7,992, whilst the whole cost of rent and establishment amounts to Rupees 6,084, nearly Rupees 2,000 less than the income derived from the public purse; they also observe that, in the years 1863-64-65, the sum of Rupees 1,725 only was expended in the purchase of copy-rights, &c., (a charge on which considerable stress has been laid,) being Rupees 575 annually, or rather less than one month's income from the grant-in-aid; in other words, the Government grant and interest for 1863 more than covers the cost of rent and establishment for that year, and the cost of copy-rights, &c., for three years.

With paragraph 6 of the Society's letter the Association entirely agrees, provided that the *voluntary organization* be adhered to; but we maintain that it is not, inasmuch as the grant does not come only out of the pockets of the "educated members of various classes," but out of the pockets of all tax-payers.

Paragraph 7 of the Society's letter. The Association is not aware that there are any insuperable obstacles in the way of Calcutta book-sellers and publishers supplying books in the Mofussil, more especially were the same assistance rendered to them that is now extended to the School Book Society, through the Inspectors of Schools in the various districts.

With reference to the books of the Sanscrit Press, the Association thinks it hardly probable that the Managers of that Institution would ever think of opening agencies of their own in the Mofussil so long as the Society sells their books under the present regulations. The Society receives from the Press a trade discount of 15 per cent., out of this sum

the Society pays the cost of carriage to Mofussil stations, runs all risks of loss and damage, and pays an Agent 6½ per cent. for selling them, besides a commission to the Secretary, an arrangement which pays the Sanscrit Press much better than the opening of Mofussil agencies of their own would do.

The Association maintains that paragraph 9 of the Society's letter proves nothing more than that the objects for which the grant was originally given are no longer in existence; that which the Society can do in the way of supplying English school books, the trade can also do. In connection with this part of the subject, the Association would be glad to know what proportion of the books imported from England are sold through the Mofussil agencies, and the proportion sold to bazar dealers in Calcutta.

In the Society's Report for 1864 and 1865 the following appears:—

	1864.	1865.
	Rs.	Rs.
"Sales by Deputy Inspectors and Agents...	21,204	31,210
"Ready money sales in the Depository, and sales to private parties" ...	33,370	33,106

Unless the Committee of the Association are wrongly informed, they believe the principal portion of the receipts for "sales in the Depository" will be found to be for books imported from England, and sold to bazar dealers in Calcutta.

The Association, notwithstanding the opinion of the Director of Public Instruction, respectfully maintains that the reply of the Society does not dispose of the allegations contained in the original memorial. It has been shewn that the Government grant for one year covers the cost of rent and establishment *for that year*, together with the cost of copy-rights for three years; and further than this it is known that the Society makes a considerable profit upon its own publications, and that they are not, as is generally represented, sold at a very trifling sum over cost price.

The Association would also beg to draw His Honor's attention to a paragraph from an advertisement just issued by Messrs. Longman, Green & Co., Publishers, from which it would appear that books, other than school books are to be obtained through the School Book Society. The firm abovementioned advertise the issue of "The British India classes," of which the following are nearly ready:—

Scott's Lady of the Lake, cantos I, II, and III.

Thomson's Seasons.

Johnson's Life of Dryden.

They state that orders will be received by the Government Central Book Depôts of Bombay, Madras, Allahabad, Lahore, Bangalore, and Nagpore, also by the *Calcutta School Book and Vernacular Literature Society*.

In conclusion I am directed to request His Honor's attention to this subject, a subject which to the trade is a most important one, and the Association respectfully hopes that the Government grant-in-aid "may," as expressed in the original memorial, "either be withdrawn, or continued conditionally on its being applied only in promotion of the objects for which the Society was formed, *viz.*, the preparation, publication, and cheap or gratuitous supply of books and materials useful in schools," &c.

A.

From J. B. KNIGHT, Esq., Master, for the Committee and Members of the Calcutta Trades' Association, to His Excellency the Viceroy and Governor General of India in Council,—the Memorial of the Calcutta Trades' Association,—(dated 12th September 1864.)

• HUMBLY SHEWETH,

THAT your Memorialists have seen in the public newspapers of the 26th ultimo, an advertisement headed "Calcutta School Book and Vernacular Literature Society," in which it is stated that the "Society now imports books in English suited for all school classes \* \* \* at rates below English prices." In the same advertisement it is stated that "the Society is aided by Government, and its profits are devoted to the purchase of copy-rights, chiefly of Vernacular school books."

That in a leading article in the *Hurkaru* of the same date, it is distinctly stated, evidently on authority, "that these books are offered at 10 per cent. under London prices," and the *Englishman* also draws attention to the fact in these words,—school books can be obtained from the Society at a far lower rate than at any of the Calcutta book sellers."

That it appears from the last Report of the Society that no less a sum than Rupees 6,270 per annum have been given by Government for the support of the School Book Society, in addition to the sum of Rupees 1,800 in aid of the publication of Vernacular literature.

That your Memorialists find, from the published reports of the Society, that the average annual amount received by sales of books is a little more than Rupees 30,000, so that the Government grant is equal to a subsidy of 20 per cent.

That while your Memorialists fully recognise the importance of encouraging the spread of Vernacular literature of a wholesome character among the Natives of India, they are strongly



of opinion that it was neither the intention, nor is it consistent with the avowed policy of the present Government of India to interfere with the full and free development of private enterprise.

That both the Reports of the Society and the advertisement above quoted tend to the conviction that the primary intention of the Government grant was to aid in the preparation and circulation of English and Vernacular literature suited to the Natives of this country, in proof of which your Memorialists may refer to the great number of English school books which have been edited and re-printed under the auspices of the Society.

That the extensive importation of English books and scholastic material by the Society are of comparatively recent date, and the rate at which these books, &c., are offered, is one which could only be adopted by a Society, whose funds were supplemented by Government and private contributions.

That the Managers and Agents of the Society are precisely those who have the power, from their position in the Educational Department under Government, of diverting the trade in books from its legitimate channel to the Society and its Agents.

That your Memorialists would respectfully point out to your Excellency the injury thus caused to the general trader, who, relying upon the demand which he has hitherto been prepared and accustomed to meet, now finds himself forestalled and superseded by the operations of a Society, carried on not only under no risk, but with positive aid from the public purse, an aid which is applied to a reduction of price below legitimate trading rates.

In support of their opinion as to the policy of the Government with reference to private enterprise, your Memorialists would point to the abolition of free dispensaries for the Unconvenanted Service, and they would respectfully submit that there is nothing, either in the position of the pupils for whose benefit the books are imported, or any such deficiency in the private means of supply, as to call for the aid of Government either to cheapen or to increase the supply.

Your Memorialists are far from wishing to interfere with the original objects of the Society, which they hold in high respect, but when its operations are so extended as to bring them into competition with private enterprise, enabled to do so successfully through extraneous aid, your Memorialists respectfully submit that their complaints are reasonable.

Your Memorialists, therefore, humbly pray, either that the Government grant-in-aid may be withdrawn, or that it may be continued conditionally on its being applied only in promotion of the objects for which the Society was formed, *vis.*, "the preparation, publication, and cheap or gratuitous supply of books and materials useful in schools," &c.

And your Memorialists, as in duty bound, will ever pray.

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B.

From E. C. BAYLEY, Esq., Secretary to the Government of India, Home Department, to the Master of the Calcutta Trades' Association,—(No. 3194, dated Simla, the 6th October 1864.)

I AM desired to inform you that the memorial of the Calcutta Trades' Association, dated 12th ultimo, praying for the withdrawal of the Government grant-in aid of the School Book and Vernacular Literature Society, or for its continuance conditionally on the grant being applied in promotion of the objects for which the Society was formed, has been transferred to Government of Bengal for disposal.

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C.

From S. C. BAYLEY, Esq., Junior Secretary to the Government of Bengal, to the Master of the Calcutta Trades' Association,—(No. 782, dated Fort William, the 10th February 1865.)

WITH reference to the memorial dated the 12th September last submitted by the Trades' Association to His Excellency the Viceroy and Governor General of India in Council, I am directed to forward the accompanying copy of a letter, No. 129, dated the 10th ultimo, and annexure, from the Director of Public Instruction, and to say that the Lieutenant-Governor reserved his opinion on the subject until he is able to refer to the last Report of the Calcutta School Book and Vernacular Literature Society, which is understood to be in the Press.

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D.

From W. S. ATKINSON, Esq., Director of Public Instruction, to the Junior Secretary to the Government of Bengal,—(No. 129, dated Fort William, the 10th January 1865.)

WITH reference to your No. 4551, dated 27th October, forwarding for report a memorial from the Calcutta Trades' Association, representing that the low prices at which the School Book and Vernacular Literature Society sell their books interfere with private enterprise, and that therefore the Government grant to the Society be withdrawn or continued conditionally, I have the honor to forward herewith copy of a letter No. 2226, dated 24th

December 1864, from the Society to my address, and to state that, in my opinion, the Society's answer completely disposes of the allegations of the Trades' Association.

The original enclosure of your communication under reply is herewith returned as requested.

From H. ANDREWS, Esq., Secretary, Calcutta School Book and Vernacular Literature Society, to W. S. ATKINSON, Esq., M. A., Director of Public Instruction,—(No. 2226, dated No. 12, Lall Bazar, Calcutta, the 24th December 1864.)

I AM directed by the Committee of the Calcutta School Book and Vernacular Literature Society to acknowledge the receipt of your docket No. 3197, dated the 3rd ultimo, forwarding a memorial from the Trades' Association of Calcutta to His Excellency the Viceroy, which memorial appears to have been transferred for disposal to the Government of Bengal.

Hon'ble W. S. Seton-Karr, C. S.,  
President.

R. B. Chapman, Esq., C. S.  
W. S. Atkinson, Esq., M. A.  
H. Woodrow, Esq., M. A.  
J. W. McCrindle, Esq., M. A.  
Rev'd W. O'Brien Smith.  
Rev'd K. M. Banerjee.  
Baboo Rajendro Lall Mitter.  
Baboo Peary Chand Mitter.

2. The Committee deem it necessary, in answer to the memorial, to explain clearly the objects and present position of the Society.

3. These objects are chiefly, as stated in the Annual Report which is now about to be published, the promotion of education by means of approved school books in the English and Vernacular languages, and also of a sound and healthy Vernacular literature. The Society aids the first of these objects by the preparation, publication, and cheap or even gratuitous supply of books and of educational apparatus, such as Maps, Plans, Globes, &c.; and it helps forward the second by publishing original works or translations of interesting and instructive English or other books into Bengali, and by compilations and adaptations suited to the Native mind. Its primary object is of course to provide, at the lowest price, suitable books for the use of schools in the several languages spoken all over the provinces subject to the Presidency of Fort William, viz., English, Urdu, Hindi, Bengali, Ooryah, Khasia, &c.

4. In furtherance of this object the Society for years past has either itself prepared books or purchased the copy-right of books, or otherwise aided authors to print and publish books, of which the successive editions have had an extensive circulation. The Government grant dates as far back as the year 1821, when Rupees 500 were sanctioned monthly in aid of the objects which the Society had then in view, and which it has ever since labored diligently to fulfil.

*Vide* Society's letter to Government dated 10th April 1821, and Mr. Secretary C. Lushington's reply in the General Department, dated 4th May 1821.

5. This grant has enabled the Society not only to purchase the copy-right of new books, and to bear the expense of revising editions of old books which are still in demand, and which expenses are occasionally not inconsiderable, but it further enables the Society to defray the expense of conveying books to the interior of Districts with all attendant risks and losses, and to maintain a system of extensive and constantly increasing book agency in the interior, which could not exist and flourish without the payment of a liberal percentage to the Agents; by this means the expense of printing becomes the main element which regulates the sale price of books. The Committee think that books would not at present reach remote districts in the Mofussil under any other system, or by mere private enterprise.

6. The correct view to be taken of the Society is, the Committee would submit, not that of a rival Establishment to any bookselling firm, but as a voluntary public organization of the educated members of various classes of the community, engaged in disseminating, over a very wide surface, cheap school literature, subordinate to, and an essential part of, the general scheme of educating the people, which the Government and private Institutions both undertake. There is no proprietary body connected with the Society, who look to derive even the smallest pecuniary profit from its operations; on the contrary, the members do not only labor gratuitously in superintending and directing the Society's affairs, but they have from time to time compiled new books for the Society, and up to a very recent period they helped it by pecuniary donations.

7. The Committee remark with satisfaction that, during late years, there has been a marked increase in the production of Vernacular books by Native authors, which command an extensive sale; so far a very important part of the objects of the Society has been accomplished. It is, of course, imperative that the books in use should be unobjectionable in matter and sentiment, and to this end no books are encouraged or patronised by the Society, unless the authors, while they retain the copy-right of their books in their own hands, agree to submit them for the inspection of the Society, previous to insertion in the Society's annual catalogue. The Committee hold a decided opinion that no Native author can afford to place his books within the reach of the people in remote districts, or in districts other than the mere neighbourhood of Calcutta, or to dispose of them at prices within the means of the middle and lower classes, if they are required to maintain an agency in the provinces for this purpose. They hold it as an indisputable fact, which meets the arguments of the Trades' Asso-

ciation, that the publishers or booksellers of Calcutta are not yet in a condition to supply the place which the Society occupies in this respect. The largest and best furnished Establishment for the supply of Bengali School books is the Sanscrit Press of Calcutta. Its stock is extensive, and its profit by the sale of books is large; yet it is not in a condition to have an agency of its own in the interior of districts. Notwithstanding the excellence of its publications, both in matter and style, the Agents of this Society, through the Society itself, are the main sources whence nine-tenths of our schools draw their supplies of these works.

8. The Committee deem it necessary to dwell on this feature of the Society's operations, and it may be observed that the advantage of the existence of such an organization was made apparent beyond controversy, when, in 1856, the Government Book Agency was abolished, and the Society was invited to undertake the supply of books for the Educational Department, and to conduct generally the business then carried on by the Book Agent. The terms to

*Vide Mr. Gordon Young's letter, dated 11th June 1856, and the Society's reply, dated 25th idem.*

which the Society then agreed, by which it contemplated no pecuniary profit to itself, and through which it has received no very appreciable return in money, were mainly fixed in consideration of the support which it already

received from the Government.

9. The Committee have yet to deal with the gravamen of the complaint contained in the letter of the Trades' Association, on which a report is requested. The Association object not so much to the preparation as to the importation of English books by the Society, and to their sale at low prices. They state that the Government grant was originally given to aid in the preparation as well as the circulation of English and Vernacular literature suited to the Natives of this country. The Committee readily admit that one of the objects of Government was to aid in the production of local English school books, but the fact is that, while several of the books first prepared by the Society are in improved editions still in circulation, others have of late years been superseded by improved works of the same character published in England, and better adapted to the present condition of education. These late and improved works it has been thought necessary to send for from England, instead of reproducing books which are inferior, and in some instances become unsaleable. The expansion of education in India, and the establishment of a University, render it absolutely imperative to import English school books of the very best standard to meet the demands of the Government and other schools.

10. As regards the sale of such English books at cheap prices, notwithstanding the opinion of the Association to the contrary, it is a fact that the Society can and does afford to import and sell English books at a percentage below London prices, without at all drawing on the Government grant.

11. The Society obtains books from the publishers in England at 33 per cent. below retail prices; some of the publishers give an additional copy of a book for every 25 copies without any extra charge. By giving up 10 per cent. of the retail price, and even allowing a percentage for packing and freight round the Cape, a margin of profit is retained, against which there is, however, a set-off by losses arising from unsaleable stock and irrecoverable debts, which the Society incurs in common with all booksellers.

12. But this the Society does not perceive how they interfere with the legitimate profits of the booksellers of Calcutta can, if they think fit, make their own terms with the publishers and booksellers at home, on the same footing as the Society. Indeed, the Committee understand that the bookselling firms import their books on the same or even on better terms. But there is this difference between their objects and the objects of the Society. The booksellers of Calcutta necessarily look to profit, while the Society contemplates only the extension of the classing of education. The Society endeavours to cheapen school books, as it is the object of Government to cheapen education for the masses of the people, and the Society imports nothing but school books, while the profits of the trading firms of Calcutta range over the whole field of literature, intellectual, scientific, entertaining, moral, and religious.

13. The Committee desire me to add that, in the tender of terms which the Society made when taking over the Government Book Agency, as mentioned in a foregoing paragraph (8) of this letter, it was expressly stipulated that they should supply the Education Department with imported books at 10 per cent. below English retail prices. It may be added that when, in 1861, the Finance Commission proposed that the Government grant should be discontinued, the proposal, after full consideration, was rejected.

14. The Committee further desire to draw your attention to their last Report for 1862 and 1863, sent to you in MS. with my letter No. 1734, dated 4th October last, as showing the extent of the Society's operations. This Report is passing through the press. Printed copies will be sent to you as soon as they issue.

15. In conclusion the Committee, with every respect for the intelligent and enterprising members of the Trades' Association, are of opinion that no substantial grievance has been made out by that body, and they trust that the Government may not think fit to comply with the prayer of the Memorialists.



E.

From J. LINDLEY, Esq., to W. MARSHALL, Esq., Assistant Secretary to the Government of Bengal, Legislative Department,—(dated Trades' Rooms, the 6th March 1866.)

With reference to your letter of the 10th February 1865, I have the honor to enquire whether anything has been done with reference to the petition forwarded from this Association respecting the grants-in-aid made to the "Calcutta School Book Society," as the Committee are informed that the Report alluded to in the letter abovementioned has been issued some time ago.

F.

From J. GEOGHEGAN, Esq., Officiating Junior Secretary to the Government of Bengal, to the Master of the Calcutta Trades' Association,—(No. 1774, dated Fort William, the 26th March 1866.)

With reference to your Secretary's letter dated the 6th instant, to the address of the Assistant Secretary to this Government in the Legislative Department, enquiring what action has been taken on the previous petition from the Association respecting the grants-in-aid made to the "Calcutta School Book Society," I am directed to state that the Lieutenant-Governor still reserves his opinion on the subject until he is able to refer to the last Report of the Society, viz., that for 1865, which is understood to be nearly ready and will issue next month.

From H. L. HARRISON, Esq., Junior Secretary to the Government of Bengal, to the Secretary to the Calcutta School Book Society,—(No. 4665, dated Fort William, the 18th November 1867.)

In forwarding for submission to the President and Committee of the School Book Society the accompanying copy of a letter, dated 17th September last, from the Secretary, Calcutta Trades' Association, containing a fresh representation in connection with the Memorial to the address of His Excellency the Governor General in Council, praying that the Government grant-in-aid for the support of the School Book Society may be withdrawn, I am directed to request the special attention of the President and Committee of the Society to the latter portion of Mr. Lindley's letter beginning at "The Association maintains that paragraph 9 of the Society's letter," and to state that the Lieutenant-Governor before passing orders will be glad to be favored with any further information and explanation on the points noticed which the Society may be able to afford.

From H. ANDREWS, Esq., Secretary to the Calcutta School Book and Vernacular Literature Society, to H. L. HARRISON, Esq., Junior Secretary to the Government of Bengal,—(No. 882, dated 9, Government Place, East, the 6th February 1868.)

I AM directed by the President and Committee of the Calcutta School Book Society to acknowledge the receipt of the fresh representation of the Calcutta Trades' Association, communicated with your letter of the 18th of November last, No. 4665, and to submit the following remarks in reply.

Hon'ble W. S. Seton-Karr, C. S., President.  
R. B. Chapin, Esq., C. S.  
W. S. Atkinson, Esq., M. A.  
H. Woodrow, Esq., M. A.  
Rev. J. Long.  
Rev. W. O'Brien Smith.  
Rev. J. Robinson.  
Rev. K. M. Banerjee.  
Babu Rajendralal Mitra.  
Babu Pearychand Mitra.  
Babu Bhodeb Mookerjee.

2. The delay which has occurred in replying to the representation has arisen from the necessity of referring to the statistics of the Society in respect of certain allegations contained in the letter of the Association.

3. The Society rely on the arguments which were elaborately and clearly set forth in their Secretary's letter

of the 24th of December 1864, as containing a successful vindication of their policy and position, and as affording a satisfactory reply to the allegations of the Trades' Association. Nevertheless, they have instructed me to forward the annexed further information for His Honor's satisfaction, and with especial reference to the portion to Mr. Lindley's letter to which you have drawn attention.

4. The Association, in paragraph 3 of their letter, remark on the application of the Government grant to the Society, which amounts to Rupees 7,800 per annum. But this amount comprises the grant to the School Book Society, and that to the Vernacular Literature Society, which two Societies, formerly separate, are now amalgamated. The proportion of the grant is Sixty Rupees 500 per month to the former, and Rupees 150 per month to the latter. The Association state that the rent and establishment are Rupees 6,084, and the purchase of copyrights only 575 annually, i. e., for two years. This may be the case, but it is not easy to see how the portion of the grant devoted to house rent and establishment can be an interference with private trade, and His Honor will perceive, from the annexed statement, that the charges for the transit of books to Government Schools amounted to Rupees 1,298 in 1864, and to Rupees 2,112 in 1865. Moreover, the Rahasya Sandarbha, a periodical published by the Society monthly, and entirely devoted to the preparation of sound and healthy vernacular literature for the Native community, costs the Society no less than Rupees 2,200 per annum, while the income from subscriptions to that paper, which subscriptions are irregularly paid, and are collected with difficulty, does not amount to Rupees 500 per annum. Of this the Association take no account.



5. The total amount of the sale shewn in paragraphs 7 and 8 of the letter from the Trades' Association to which the Committee are now replying, or Rupees 33,000, in round numbers, for the years 1864 and 1865 respectively, is, no doubt, correct as a total, but the proportion of the sales of imported books to bazar dealers in Calcutta in that total, requires some explanation. The Association do not distinguish between ready money sales at the Depository in Calcutta and sales to bazar dealers at the same place, nor do they distinguish between the sale of imported books and school apparatus, and books and maps published by the Society here. The Association have been misled when they think that the principal portions of the receipts for sales in the Depository "will be found to be for books imported from England and sold to bazar dealers in Calcutta." By far the largest portion of the Society's dealings are with Mofussil agencies, and parties other than bazar dealers. Enclosed will be found a correct statement of the sales of imported books to bazar dealers, whereby it will be seen that the sales to such dealers were as follow:—

For 1864	Rupees 5,279-15-3
And for 1865	4,081-1-11

The remainder of the sum of Rupees 33,000 consists of items of sales of the Society's own books, and of imported books to Government schools, and to Missionary and other Native schools not connected with Government.

6. The Association observe, in paragraph 9 of their letter, that the Society makes a considerable profit upon its own publications. This statement, the Committee beg to represent, gives a different idea of the Society's position to that which they consider the true one. The profit, at best, is not more than 10 per cent., and the Society has to bear all the loss from unsaleable stock, and from books which are constantly destroyed by damp and neglect while in store at the agencies appointed to supply the numerous schools in the interior of the country. The Society is besides exposed to repeated losses, owing to the death of some agents whose affairs are found to be in confusion, and to the dishonesty or inability to make good their dues on the part of others, and every year considerable sums are written off under this head. No private firm could carry on business in this way, but these risks are literally inseparable from the position of the Society as a pioneer of civilization, and, under these circumstances, it seems to them an wholly erroneous assumption to say, as the Association appear to do, that the original objects for which the grant was given no longer exist, of that, if the Society were to cease, its business would be taken up by European traders in the same way in Assam, British Burmah, Eastern and Lower Bengal, Behar or Upper India.

7. In conclusion the President and Committee again beg to draw the attention of His Honor the Lieutenant-Governor to the position, objects, and character of the Society, and to the place which it fills in the whole educational scheme of Government. Its operations are extended to distant and remote Provinces, where no interference is or can be exercised with the trade of European firms in Calcutta, and to agencies and schools with which, under the inevitable risks of such operations, they believe that no Calcutta Bookseller has shewn any wish or anxiety to have any dealings at all. Under other Governments, the business here undertaken by this Society, and which is indispensable to any general scheme of education conducted or presided over by Government, is discharged by a distinct branch of the Educational Department; and if the Society were to be abolished, or its sphere materially contracted, many difficulties would, the Committee think, be certain to arise, which would seriously interfere with the progress of education, the intentions of Government, and the improvement of the people.

## A.

*Abstract account of transit charges, &c., paid by the Society on account of Agencies in the transmission of books, &c.*

1864.			1865.		
	Rs.	A. P.		Rs.	A. P.
January	122	9 3	January	201	15 2
February	87	9 6	February	170	6 0
March	126	8 3	March	166	3 3
April	109	0 3	April	154	3 0
May	85	1 0	May	170	1 0
June	98	13 9	June	236	9 9
July	112	0 6	July	283	7 0
August	92	13 6	August	96	13 9
September	58	2 9	September	49	2 6
October	39	5 0	October	100	0 9
November	22	6 3	November	188	11 0
December	344	6 9	December	295	4 3
Total Rupees	1,298	12 9	Total Rupees	2,112	13 5

B.

*Statement of Imported Books sold to Bazar Dealers.*

1864.				1865.			
	Rs.	A.	P.		Rs.	A.	P.
January	... 1,498	9	6	January	... 1,208	12	0
February	... 212	14	0	February	... 358	10	0
March	... 216	5	6	March	... 79	11	8
April	... 183	4	9	April	... 83	5	3
May	... 296	5	6	May	... 62	9	0
June	... 340	10	9	June	... 135	9	6
July	... 569	4	6	July	... 652	11	0
August	... 511	10	6	August	... 474	13	3
September	... 272	0	6	September	... 85	7	0
October	... 61	10	0	October	... 175	0	3
November	... 247	5	6	November	... 332	10	3
December	... 869	14	3	December	... 431	14	9
Total Rupees	5,279	15	3	Total Rupees	4,081	1	11

From H. L. HARRISON, Esq., Junior Secretary to the Government of Bengal, to the Secretary to the Calcutta Trades' Association,—(No. 1333, dated Fort William, the 16th March 1868.)

In acknowledging the receipt of your letter of the 17th September last, and its enclosures. I am directed to forward the accompanying copy of a letter\* from the Secretary to the Calcutta School Book and Vernacular Literature Society, and to state that the Lieutenant-Governor, having very carefully considered the representation made by the Calcutta Trades' Association, is of opinion that the Government cannot, consistently with its avowed object of promoting education throughout the country, withdraw the aid now given to this useful Society, or call upon it in any measure to contract its operations.

\* No. 331, dated 6th February 1868.

**Report on the Cultivation of Cinchona at Darjeeling during the month of December 1867.**

From T. ANDERSON, Esq., M. D., Superintendent, Botanical Gardens, and in charge of Cinchona Cultivation in Bengal, to the Junior Secretary to the Government of Bengal, — (No. 125, dated Botanical Gardens, the 6th March 1868.)

I HAVE the honor to forward the Report on the cultivation of Cinchona at Darjeeling during the month of December 1867.

*Report on the cultivation of Cinchona at Darjeeling during the month of December 1867.*

THE work performed during the month of December has been the continuation of the operations of November, viz., clearing and hoeing the plantations, repairing roads and bridges, cutting jungle for the extension of the open air plantations, and the making of new bridle roads.

63,500 cuttings were made during the month, and 18,000 seedlings of *C. Officinalis* were added to the open air nursery beds.

5,315 plants of *C. Succirubra* were planted in the open air as an experiment. The weather during the month was very bright and sunny; a slight shower of rain occurred on the 13th. The total rain fall during 1867 at the inspection but 5,000 feet above the sea was 182.4 inches.

*Table shewing the temperature of the month at the different plantations.*

PLANTATIONS.	Mean Maximum.	Mean Minimum.	Mean Temperature.	REMARKS.
2nd Plantation ...	53.2	41.1	47.1	
3rd Ditto ...	55.7	43.3	49.5	
4th Ditto ...	65.4	45.2	55.3	
5th Ditto ...	Thermometer accidentally broken.			

*Table shewing the maximum and minimum growth during the month of December 1867.*

NAMES OF SPECIES.	TEESTA.		RUNGBEE.		
	First Plantation.	Second Plantation.	Third Plantation.	Fourth Plantation.	Fifth Plantation.
<i>C. Succirubra</i> ..	$\frac{1}{2}$ inch ...	$\frac{1}{4}$ to $\frac{1}{2}$ inch	Not measured.	$\frac{1}{4}$ to $2\frac{1}{2}$ ins.	$\frac{1}{4}$ to $3\frac{1}{2}$ inches.
<i>C. Micrantha</i> ..	None ...	None ...	Ditto.	None ..	$\frac{1}{4}$ to 2 " "
<i>C. Officinalis</i> ..	No plants...	No plants ...	$\frac{1}{4}$ to $\frac{1}{2}$ inch ..	$\frac{1}{4}$ to 2 " "	$\frac{1}{4}$ to $1\frac{1}{2}$ " "
<i>C. Pabudiana</i> ..	Not measured	Not measured	Not measured.	None ..	None.

*Number and Distribution of Cinchona Plants in the Government Plantations at Rungee on the 1st January 1868.*

NAMES OF SPECIES OF CINCHONA.	Number in permanent Plantations.	Number of stock plants for propagation.	Number of seedlings or rooted cuttings in nursery beds for permanent Plantations.	Number of rooted plants in cutting beds.	Number of cuttings made during the month.	Total number of plants, cuttings, and seedlings.
<i>C. Succirubra</i> .. ..	2,56,143	20,000	1,86,795	2,11,019	22,500	6,88,457
<i>C. Calisaya</i> .. ..	150	4,158	None.	4,946	1,000	10,254
<i>C. Micrantha</i> .. ..	5,558	1,000	8,220	15,880	None.	80,687
<i>C. Officinalis</i> and Varieties ..	1,30,919	10,000	2,40,476	*2,88,013	40,000	7,02,408
<i>C. Pabudiana</i> .. ..	5,092	None.	None.	None.	None.	5,092
Total ..	3,97,862	35,158	4,35,491	5,19,867	63,500	14,51,378

\* 18,000 seedlings have been added.

J. GAMMIE,  
Head Gardener in Charge.

TABLE showing the growth of Cinchona in the Teesta and Rangbée Plantations during the month of December 1867.

Numbers.	Name.	1st PLANTATION, (TESTA) ALTITUDE.						2nd PLANTATION, (TESTA) ALTITUDE.						3rd PLANTATION, (RANGBEE) ALTITUDE 4,410 FEET.						4th PLANTATION, (RANGBEE) ALTITUDE 3,335 FEET.						5th PLANTATION, (RANGBEE) ALTITUDE 2,650 FEET.					
		Date of planting 1866.	Height in inches on 31st March 1866.	Height on 30th November.	Height on 1st January.	Growth during December.	Date of planting 1866.	Height in inches on 31st March 1866.	Height on 30th November.	Height on 1st January.	Growth during December.	Date of planting 1866.	Height in inches when planted.	Height on 30th November.	Height on 1st January.	Growth during December.	Date of planting 1866.	Height in inches when planted.	Height on 30th November.	Height on 1st January.	Growth during December.	Date of planting 1866.	Height in inches when planted.	Height on 30th November.	Height on 1st January.	Growth during December.	Date of planting 1866.	Height in inches when planted.	Height on 30th November.	Height on 1st January.	Growth during December.
1	C. Saccubra	18th Nov...	5	62	62	0	18th Nov...	2	38	38	0	18th Nov...	...	...	...	...	18th Nov...	...	...	...	...	18th Nov...	...	...	...	18th Nov...	...	...	...	...	...
2	Ditto	18th " "	6	61	61	0	18th " "	3	41	41	0	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
3	Ditto	18th " "	4	58	58	0	18th " "	5	53	53	0	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
4	Ditto	18th " "	4	61	61	0	18th " "	2	62	62	0	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
5	Ditto	18th " "	4	72	72	0	18th " "	3	64	64	0	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
6	Ditto	18th " "	4	65	65	0	18th " "	3	65	65	0	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
7	Ditto	18th " "	4	75	75	0	18th " "	4	66	66	0	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
8	Ditto	18th " "	4	64	64	0	18th " "	3	62	62	0	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
9	Ditto	18th " "	5	81	81	0	18th " "	3	47	47	0	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
10	Ditto	18th " "	12	50	50	0	18th " "	4	63	63	0	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
1	C. Microantha	18th " "	2	51	51	0	18th " "	3	84	84	0	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
2	Ditto	18th " "	3	71	71	0	18th " "	2	77	77	0	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
3	Ditto	18th " "	1	76	76	0	18th " "	2	47	47	0	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
4	Ditto	18th " "	2	91	91	0	18th " "	1	51	51	0	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
5	Ditto	18th " "	3	75	75	0	18th " "	1	72	72	0	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
1	C. Officinalis	18th " "	...	...	...	...	18th " "	...	...	...	...	18th Dec...	8	41	41	0	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
2	Ditto	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	6	42	42	0	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
3	Ditto	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	5	27	27	0	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
4	Ditto	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	5	34	34	0	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
5	Ditto	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	5	34	34	0	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
6	Ditto	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	5	38	38	0	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
7	Ditto	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	4	43	43	0	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
8	Ditto	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	6	34	34	0	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
9	Ditto	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	6	32	32	0	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
10	Ditto	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	6	41	41	0	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
1	C. Pahudiana	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
2	Ditto	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
3	Ditto	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
4	Ditto	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
5	Ditto	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
6	Ditto	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
7	Ditto	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
8	Ditto	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
9	Ditto	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...
10	Ditto	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	...	18th " "	...	...	...	18th " "	...	...	...	...	...

\* Nos. 2, 3, 4, eaten over by deer.

T. ANDERSON, M. D.,  
Superintendent of the Botanical Gardens,  
and in charge of Cinchona Cultivation in Bengal.



Recent Outbreak of Cholera at Dacca.

From H. L. HARRISON, Esq., Junior Secretary to the Government of Bengal, to the Officiating Commissioner of the Dacca Division,—(No. 768, dated Fort William, the 12th February 1868)

I AM directed to draw your attention to paragraph 13 of the Report on Native Papers for the week ending 18th ultimo, and to request that you will be good enough to favor the Lieutenant-Governor with a report on the cholera alleged to have broken out in a virulent form in the City of Dacca.

*Extract from the Report on Native Papers for the week ending 18th January 1868.*

PARA. 13. While looking on, says the Editor of the *Dacca Prokash*, cholera has assumed a virulent form all over this town. No estimate has yet been made of the number of victims it has counted, but it appears to kill all whom it attacks. The doctors say that no medicine checks it this time. They have used all the remedies at their command but with no effect. The Mitford Hospital is crowded with cholera patients; and from one hospital the corpses of fifty victims have been carried away. Several Policemen have been attacked with this disease and taken to hospital, but as there is no more room in the dwelling it has been decided to erect a tent for them. We hear that a native doctor has been deputed to enquire at each house in the town and the adjacent villages and submit a correct report of the mortality. What immediate good this will effect we cannot imagine. In our opinion if there is any sure method of keeping off or curing this disease, our rulers should publicly notify it. A lengthy report on the deaths which have occurred will do no good. Let the welfare of the living be first secured.

From F. B. SIMSON, Esq., Officiating Commissioner of the Dacca Division, to the Secretary to the Government of Bengal,—(No. 179T., dated Mymensing, the 2nd March 1868.)

In reply to your letter No. 768 of the 12th February, I have the honor to forward copy of a careful report from Dr. Wise, No. 57 of the 21st of February, on the late outbreak of cholera at Dacca.

2. Dr. Wise agrees with the Natives in thinking that impure water is the great cause of cholera. But in this instance, as in very many, contagion and infection appear to me to have been the agents of its introduction. I am, however, painfully alive to the effects of bad water.

3. Dr. Wise remarks that tanks and drinking water generally are becoming less pure, now-a-days. My attention is directed to this fact and to the best way of alleviating the evil, and I will shortly forward a report on the subject.

4. In Dacca there is always a supply of good water sufficiently handy, but what can a Government do when the Natives prefer to use the filthy slime of the Dolye Khall to the pure water of the Booree Gunga, simply because the first is a little nearer than the last?

5. It would be easy to pump water by steam from the river along aqueducts to all parts of the city, as is done in Calcutta. This is a mere matter of money, if it be deemed necessary, and for Dacca I think it might be so deemed, and in the end it would be the cheapest mode, I believe, of giving a healthy supply of pure water.

6. For Mofussil measures I defer my report, as I am on circuit and cannot obtain either the data or the information I require.

From JAMES WISE, Esq., M. D., Civil Assistant Surgeon, Dacca, to F. B. SIMSON, Esq., Officiating Commissioner of the Dacca Division,—(No. 57, dated Dacca, the 21st February 1868.)

In reply to your memorandum No. 2214 of the 18th instant, and its enclosure from Government, I have the honor to inform you that the epidemic of cholera, referred to in the native press, occurred in the beginning of last month. I made no special report at the time, as I was fully occupied in trying to check the disease, but I informed you and the Magistrate almost daily of the extent of the epidemic and the course it was taking. The following are the full particulars of the outbreak, which though very fatal, fortunately only lasted three weeks and did not carry off nearly so many as other out-breaks which have occurred in Dacca of late years and have attracted no notice.

Cholera always breaks out in this city during November and December. The cyclone of November 2nd, and the heavy rain which fell between the 11th and 15th of that month, retarded its appearance; one case was admitted into the Mitford Hospital during that month.

The outbreak of cholera in the city in November is always referred by the Natives to the annual fair held near Moonsheegunge. This fair lasted from the 12th November to the

18th December 1867. Up to within a few days of its termination not a single case of cholera appeared among the crowds congregated at it. On the 19th November two men returned from this fair. Both were taken ill of cholera on reaching their homes in Bungla Bazar, and both died. The disease did not spread at this time. About the same date a man named Hurry Doss visited the fair and returned to his house at Bungas, one of the northern Mohullas of Dacca. He died of cholera next morning. Two women in the neighbourhood were attacked soon afterwards with the disease and died. No other cases occurred. Up to the 22nd of December no fresh out-break of cholera was reported to me. On that date a man was admitted into Hospital from Ecrampoor. On the 29th three cases, one a Constable from the Jail Guard. On the 31st, a man from Eslampoor, in the centre of the town, was received into Hospital. On the same date and in the same Mohullah two other persons were treated. The disease at this time was mild, and a considerable proportion recovered.

It was not until the 3rd January that the disease appeared in an epidemic form. All along the main street of Dacca from the Chouk to the Iron Bridge cases were met with, but in one or two localities the disease settled with unusual virulence. Narandea, Ecrampoor, Sootrapoor, and Bungla Bazar on the east, Islampoor, Baboo Bazar, and Nulgola in the centre, were during the first week the quarters which suffered most. The disease was characterised by few premonitory symptoms, one stool was in many instances followed by collapse and by death within five hours. It was the short interval between seizure and death which marked this out-break as peculiar and struck terror into the minds of those who had seen and passed through much more extensive epidemics in Dacca than this one. Up to the 11th no case had occurred west of the Chouk. On the 12th and 13th four cases were treated in Rohomutgunge. The disease steadily advanced up to the bank of the river, leaving the whole north of the town and all the Mohullas which lie on the far side of the Khall, which intersects the city untouched. Sakrie Bazar, the filthiest and most densely inhabited spot in Dacca, had only two deaths within its boundaries. One was a man who had returned from a long journey and had passed through villages where the disease was prevalent.

No case occurred in the Jail or Lunatic Asylum during the month. By the 20th the disease had abated in the city, but on that date the villages of Waspoor, Sreekhanda, and Buseela, 4 miles on the north-west of the city, were severely attacked and many died. From that date until the 1st February no further cases from the neighbourhood of Dacca were reported. On the 1st, at the request of the Zemindar, I visited the village of Goran, 4 miles on the north-east of the city. I found a most deplorable state of matters. In one house the grand-father, father, and four children of a family were lying in the collapse of cholera. In the next house a mother and two children were in a similar condition. Up to the 2nd February, 40 cases or 26 per cent. had died. This out-break fortunately lasted only a few days, but it caused much greater mortality than in any other place when the disease appeared. From 1st until the 18th instant cholera was not met with in Dacca. Within the last few days a few cases have been reported within the town.

I regret that I was unable to ascertain where the men lived who died in Bungla Bazar in November, and whether the out-break at the end of December could be connected in any way with them or not. This would have been a most important and valuable point to have determined. On such subjects no information can be derived from Natives.

The only peculiarity was the great difference of temperature between night and day. On the 3rd January the temperature fell to 52°, the lowest point it reached within the month. On that day the maximum range recorded was 73°, a difference of 21 degrees. For the month, the mean difference in the 24 hours was 20.

At night the wind was always north-west, varying occasionally towards the west in the afternoon. Its greatest velocity was on the 8th, when the Anemometer recorded a rate of only 6·4 miles per hour. The average velocity during the month was only 3·76 miles per hour, almost a complete calm. The Barometer, as usual, during January, was very high and varied very little from day to day.

A Register of deaths has been kept by me in the eastern Mohullas of the town for several months. I am therefore able to give an authoritative contradiction to the exaggerated reports which were spread by the secret correspondents of the Native Papers, and which during the epidemic did as much harm as they possibly could by publishing false reports which had no foundation.

In the Mohullas where the disease was most virulent from the 1st to 31st January 50 deaths from cholera only occurred, namely, 35 males and 15 females. Many doubtless died away from their homes, having fled from fear of the disease; others again died in Hospital.

Between the 1st and 21st January, 163 out-patients were treated at the Mitford Hospital. In 147 cases the result was ascertained by enquiries made at their homes. Seventy-three or 49·6 per cent died, and seventy-four or 50·3 per cent. survived. This is by no means an excessive mortality for a cholera epidemic. Comparing the death rate during the three weeks the epidemic lasted, we find that from the 1st January to 27th January 26 cases

were treated, of whom 18 or 69·2 per cent. died ; 8th to 13th January 56 cases were treated, of whom 29 or 51·7 per cent. died ; 16th to 21st January 65 cases were treated, of whom 24 or 36·9 died.

The mortality among the in-patients of the Mitford Hospital was very great. The state in which the sick were brought there almost precluded hope. They had been ill for periods varying from a few hours to several days, and were generally pulseless and collapsed when admitted.

Between the 1st and 16th January 31 cases were received, of these only four recovered. Ten died within eight hours of admission. The first cases died in collapse, no attempt at reaction being made. Afterwards death was caused by Uræmia or by a relapse of the disease.

Natives all entertain the idea that cholera has a great deal to do with the quality of the water they drink ; unfortunately this impression does not prevent them using the nearest pool, however filthy it may be. During the late epidemic the two places where cholera was most virulent were those in which the drinking water was most at fault, and that in use by the people was unfit for human consumption.

The residents in Sootrapoor, Eckrampoor, and Narandea make use of the water of the Dolai Khall which runs close to them. At this season it contains only a shallow tidal stream which is beat up into a semi-liquid body by the boats which are constantly passing through it. Its banks are soiled by the inhabitants. No wells exist in this part of the town, and the people are too lazy to carry water from the river which is distant only a few hundred yards.

The other instance was the village of Goran. The inhabitants only possessed two reservoirs of water. One had been polluted by the immense quantity of leaves drawn into it by the cyclone, the other was used indiscriminately by man and beast and for bathing and drinking purposes.

It is this scarcity of good drinking water which is injuring the health of the people of Eastern Bengal. Tanks are now-a-days never made, and those which are in use have become shallow and overgrown with vegetation, and the water is becoming more and more unfit for consumption.

The greatest want in Dacca is a good system of drainage. No attempt to improve the present drains has been made. The wells which exist contain most impure water, and the river is the only source whence the people can obtain any that is wholesome. The tanks in Dacca are, if possible, more abominable than those in the Mofussil.

It is hopeless to expect that cholera will be ever unknown in Dacca until proper measures are taken for providing the inhabitants with good pure water. The epidemics which every few years break out in the city are preventible, but a large outlay of money will be necessary, and strict rules of conservancy must be enforced.

It is difficult to suggest any plan for improving the tanks in Mofussil villages, but the Zemindar and Government being the only parties directly interested in the health of the people, it is incumbent on them to take measures for providing wholesome water for general use. The want of pure water is yearly increasing, and the growth of the population is being seriously interfered with by the wide-spread and fatal out-breaks of disease which are annually decimating one or other of the villages of Eastern Bengal. In anticipation of further legislation it ought to be made compulsory on every village community to appropriate one tank in each village for drinking purposes alone, and the Zemindars or Matbars be made responsible for its proper cleanliness and purity.

The License Tax.

STATEMENT of Amount collected under Act XXI. of 1867 in the Lower Provinces.

	PRESIDENCY.				MOFUSSIL.				Total.
	Before reported.	FOR THE WEEK ENDING			Reported to close of January 1868.	In February and March 1868.			
		29th February.	7th March.	14th March.					
	Rs. As. P.	Rs. As. P.	Rs. As. P.	Rs. As. P.	Rs. As. P.	Rs. As. P.	Rs. As. P.		
Collections	4,62,221 15 5	1,964 0 0	348 0 0	928 8 0	10,71,375 0 0	13,927 0 0	15,50,664 5 5		
Deduct Refunds	33,199 13 7	672 0 0	46 0 0	180 0 0	82,646 0 0	1,056 0 0	1,17,799 13 7		
Remaining	4,29,021 15 10	1,292 0 0	302 0 0	748 8 0	9,88,729 0 0	12,771 0 0	14,32,864 7 10		
Deductions (at the Presidency by the Examiner of Claims) from salaries of servants, under	27,415 15 4	408 14 10	.....	.....	.....	.....	27,824 14 2		
Ditto at Mofussil Treasuries	24,575 8 4	100 14 8	.....	.....	72,169 0 0	20 0 0	24,776 7 0		
Ditto at other Local Offices	.....	.....	.....	.....	.....	.....	72,189 0 0		
Ditto in Military Department, less refunds, Rupees 2,023-5-4.	.....	.....	.....	.....	.....	.....	12,140 0 0		
Grand Total	4,81,113 7 6	1,801 13 6	302 0 0	748 8 0	10,60,898 0 0	12,791 0 0	15,89,046 7 8		



Results of the Meteorological Observations taken at the Surveyor-General's Office, Calcutta, from 15th to 21st March 1868.

MONTH.	Date.	Reduced Reading of Barometer at 10 A. M.	THERMOMETER.		Daily Range of the Temperature.	Mean Temperature for the day.	Mean Wet Bulb.	Computed Mean Dew-point.	Mean Degree of humidity for the day.	Prevailing Direction of Wind during the day.	Rain.	Max : Pressure of Wind		Daily Velocity of Wind.	GENERAL REMARKS.
			Highest Reading.	Lowest Reading.								Max :	Pressure of Wind		
		Inches.	°	°	°	°	°	°			Inches.	lb	Miles.		
March ..	15th	29.921	90.5	74.6	15.9	83.9	75.2	71.2	0.73	S S W & S	...	2.0	267.9	Scattered clouds.	
	16th	.976	88.8	73.0	15.8	79.9	74.8	71.2	.76	E S E	...	0.1	120.4	Clear and cumuli.	
	17th	30.049	92.0	72.2	19.8	81.3	74.9	70.4	.71	Variable.	0.16	12.0	85.7	Scattered cumuli and overcast, high wind, thunder and rain at 8 P. M. Lightning from 7 to 9 P. M.	
	18th	.029	88.0	68.5	19.5	77.5	68.7	62.5	.61	N W & N N E	...	2.0	174.0	Chiefly clear.	
	19th	29.979	89.0	71.0	18.0	79.1	69.6	62.9	.59	Variable.	..	0.6	96.6	Clear and scattered cumuli	
	20th	.071	91.0	72.4	18.6	80.7	72.5	66.8	.64	S S W & S by W	...	0.8	140.9	Chiefly clear.	
	21st	.081	93.5	74.5	15.9	82.5	73.5	67.2	.61	S W & S by W	...	0.3	163.0	Clear and scattered cirri.	

The mean Temperature and the mean Wet Bulb are derived from the twenty-four hourly Observations made during the day.

The Dew-point is computed with the Greenwich constants. The figures in column ten represent the humidity of the air, the complete saturation of which being taken at unity. The receiver of the lower rain gauge is 1 foot 2 inches, and that of the Anemometer 70 feet 10 inches, above the level of the ground. The velocity of wind, as indicated by Robinson's Anemometer, is registered from noon to noon.

The extreme variation of Temperature during the past seven days				...	...	25.0
The Max. Temperature during the past seven days				...	...	93.5
The Max. Temperature during the corresponding period of the past year				...	...	94.0
The mean humidity during the past seven days				...	...	0.66
The mean humidity during the corresponding period of the past year				...	...	0.67
						Inches.
The total fall of rain from 15th to 21st...				{ by lower rain gauge		0.16
				{ by Anemometer gauge		0.10
Ditto	ditto	from 15th to 21st, average of fourteen previous years			...	0.19
Ditto	ditto	between the 1st January and the 21st current			...	0.39
Ditto	ditto	during the corresponding period of the past year			...	1.50

The 23rd March 1868.

GOPEENATH SEN,  
In charge of the Observatory.

## Meteorological Report up to 14th March 1868.

STATIONS.	March.	Hour.	Barometer reduced to 32°.	THERMOMETER.		Humidity Sat. = 100.	WIND.		Rain.	WEATHER.
				Dry.	Wet.		Direction.	Velocity.		
CALCUTTA.	8th	10	Inches.	⊖	⊖				Inches.	
			29.916	73	59	38	N	...	...	Clear.
		16	29.814	81	61	25	W	...	...	Ditto.
	9th	10	30.018	77	70	68	S by W	...	...	Ditto.
		16	29.881	86	70	41	S S E	...	...	Ditto.
	10th	10	29.948	80	72	68	S	...	...	Scattered cirrostrati.
		16	29.799	81	73	66	S	...	...	Overcast and nimbi to S.
	11th	10	29.995	74	66	59	N by W	...	...	Clear.
		16	29.896	82	64	32	W N W	...	...	Ditto.
	12th	10	30.105	77	60	53	S E	...	...	Ditto.
		16	29.958	83	64	30	W S W	...	...	Ditto.
	13th	10	30.050	79	69	58	S S W	...	...	Ditto.
		16	29.925	87	68	27	W S W	...	...	Ditto.
	14th	10	29.942	82	75	70	S	...	...	Ditto.
		16	29.814	89	76	49	S S E	...	...	Ditto.
SALGORE ISLAND.	8th	9-30	29.833	74	62	47	N	Light	...	Cloudless.
		16	29.767	82	78	82	S W	Light	...	Ditto.
	9th	9-30	29.827	79	73	73	S	Light	...	Scattered clouds.
		16	29.868	82	75	70	S W	Moderate	...	Clear.
	10th	9-30	29.913	80	74	74	S W	Moderate	...	Scattered clouds.
		16	29.878	74	69	76	N	...	...	Sky overcast with clouds, slight fall of rain at 16 hours.
	11th	9-30	29.907	76	67	60	N	Moderate	...	Cloudless, slight fall of rain at 4 hours this morning.
		16	29.844	84	71	50	N E	Light	...	Clear.
	12th	9-30	30.018	76	69	68	E	...	...	Ditto.
		16	29.919	81	70	55	S W	...	...	Ditto.
	13th	9-30	29.997	79	76	86	N	...	...	Scattered clouds.
		16	29.887	81	76	78	S W	...	...	Cloudless.
	14th	9-30	29.916	81	77	82	W	Moderate	...	Scattered clouds.
		16	29.794	83	78	78	S W	Strong	...	Cloudless.
CHITTAGONG.	8th	9-30	29.791	73	68	76	S by E	Light	0.76	Scattered cumuli.
		16	29.634	76	70	72	W	Light	...	Hazy.
	9th	9-30	29.806	72	66	71	N N E	Light	...	Ditto.
		16	29.816	75	67	63	W by S	Light	...	Ditto.
	10th	9-30	29.804	72	63	68	N E	Light	...	Ditto. Unsteady wind.
		16	29.773	76	68	64	W by S	Light	...	Misty horizon.
	11th	9-30	29.835	79	73	73	S S E	Light	0.89	Cumuli, smart short showers at 9.30.
		16	29.768	77	74	86	S W by W	Moderate	...	Cumuli, towards N. & N. E. & N. hazy.
	12th	9-30	29.945	71	63	61	N E	Light	...	Hazy.
		16	29.853	76	68	56	W	Light	...	Ditto.
	13th	9-30	29.832	70	64	70	E N E	Light	...	Ditto.
		16	29.863	76	68	64	W S W	Light	...	Ditto.
	14th	9-30	29.791	72	70	90	S by E	Light	...	Cumuli round horizon.
		16	29.798	77	73	81	S W by W	Light	...	Hazy.
AHMEDABAD.	8th	9-30	29.801	73	70	85	S E	Light	0.22	Fine.
		16	29.832	80	71	70	W	Light	...	Ditto.
	9th	9-30	29.971	74	71	85	E	Light	...	Ditto.
		16	29.842	80	74	74	N W	Light	...	Ditto.
	10th	9-30	29.991	73	68	76	N E	Light	...	Ditto.
		16	29.857	82	73	63	W	Light	...	Ditto.
	11th	9-30	29.950	77	71	73	S E	Light	...	Ditto.
		16	29.870	81	77	82	W	Light	...	Ditto.
	12th	9-30	30.010	77	72	77	N E	Light	...	Ditto.
		16	29.900	81	70	55	W	Moderate	...	Ditto.
	13th	9-30	30.003	76	67	60	N	Light	...	Ditto but windy.
		16	29.902	80	70	58	W N W	Moderate	...	Ditto.
	14th	9-30	29.963	78	70	72	N	Light	...	Ditto.
		16	29.800	81	73	66	W	Moderate	...	Ditto but wind.
CUTTACK.	8th	9-30	29.988	76	61	37	N E by E	...	...	Cloudless and fine day.
		16	29.856	80	65	40	S S E	...	...	Sultry and misty horizon.
	9th	9-30	30.013	77	71	73	E	...	...	Scattered cirri to S. W., N. W., & N. E. horizon, & hazy.
		16	29.900	82	72	56	S by E	...	...	Scattered cirrostrati, sultry, & misty horizon.
	10th	9-30	29.997	81	74	70	S by E	...	...	Cirrostrati & partially overcast
		16	29.877	74	70	81	S S E	...	0.1	Covered with strati.
	11th	9-30	30.034	78	68	67	N	...	...	Fine clear sky.
		16	29.931	83	65	33	N N W	...	...	Clear misty horizon.
	12th	9-30	30.115	78	67	69	E by N	...	...	Ditto ditto.
		16	29.989	83	68	36	E	...	...	Cirro to S. E. horizon.
	13th	9-30	30.073	78	73	77	S W by S	...	...	Scattered cirri & misty horizon
		16	30.054	85	64	28	W N W	...	...	A cluster of cirri to S. E., misty horizon, & calm.
	14th	9-30	30.014	81	74	70	S W	Moderate	...	Clear.
		16	29.864	86	71	44	S by W	...	...	Clear, misty horizon, unsteady wind.
BOMBAY.	8th	10	29.905	90	75	47	S S W	12°	...	Fine.
		16	29.771	85	75	60	S E	13°	...	Ditto.
	9th	10	29.957	85	75	60	S	11°	...	Passing clouds.
		16	29.825	85	75	60	S E	16°	...	Clear.
	10th	10	30.001	84	73	56	S	8°	...	Passing clouds.
		16	29.848	86	75	60	S E	15°	...	Clear.
	11th	10	29.979	85	74	57	S E by S	6°	...	Fine with passing clouds.
		16	29.867	84	74	60	E S E	13°	...	Clear.
	12th	10	30.050	83	73	60	S S W	4°	...	Fine with light clouds.
		16	29.939	85	74	57	E by N	10°	...	Clear.
	13th	10	30.040	83	78	60	E S E	7°	...	Passing clouds
		16	29.922	85	74	57	E S E	8°	...	Clear.
	14th	10	30.019	84	74	60	S E	8°	...	Fine with passing clouds.
		16	29.890	84	78	75	S E	9°	...	Clear.

\* Velocity in miles per hour.

STATIONS.	March.	Hour.	Barometer reduced to 32°.	THERMOMETER.		Humidity Sat. = 100.	WIND.		Rain.	WEATHERS.
				Dry.	Wet.		Direction.	Velocity.		
Dacca.	8th	0-30	29.841	73	62	50	N W	...	...	Light wind, clear.
		16	29.756	75	63	47	W	...	...	Ditto ditto.
	9th	0-30	29.058	74	68	72	S E	...	...	Ditto ditto.
		16	29.846	71	66	75	W S W	...	...	Light wind, partially cloudy.
	10th	0-30	29.938	74	69	70	N E	...	...	Ditto, clear.
		16	29.836	75	68	68	S E	...	...	Ditto, threatening, sky overcast.
	11th	0-30	29.884	72	69	85	W N W	...	0.1	Ditto, clear.
		16	29.806	75	67	63	W N W	...	...	Ditto, ditto.
	12th	0-30	29.9.8	74	67	67	N W	...	...	Ditto, ditto.
		16	29.903	71	66	75	W N W	...	...	Ditto, ditto.
	13th	0-30	29.965	75	68	68	S S W	...	...	Ditto, ditto.
		16	29.858	78	67	53	W	...	...	Ditto, ditto.
	14th	0-30	29.913	76	74	90	S W	...	...	Ditto, partially cloudy.
		16	29.758	82	75	70	S S W	...	...	Ditto, clear.
BENARAS.	8th	10	29.693	...	...	...	S W	Moderate.	...	Strati, cirrostrati.
		16	29.424	...	...	...	N W	Moderate.	...	
	9th	10	29.808	...	...	...	S E	Light	...	Cirrocumuli, strati.
		16	29.587	...	...	...	E	...	...	
	10th	10	29.857	...	...	...	E	...	...	Strati.
		16	29.606	...	...	...	S W	Strong	...	
	11th	10	29.803	...	...	...	N W	Light.	...	Ditto.
		16	29.700	...	...	...	W	Light.	...	
	12th	10	29.856	...	...	...	Calm	...	...	
		16	29.740	...	...	...	W	Light.	...	
	13th	10	29.789	...	...	...	W	...	...	
		16	29.682	...	...	...	W	...	...	
	14th	10	29.436	...	...	...	Calm	...	...	Cirrocumuli, cumuli.
		16	29.545	...	...	...	W	...	...	
ROCKHILL.	8th	9-30	28.932	68	58	51	Calm	...	...	{ Cool bright morning, at 13 hours sky overcast and rain threatening, at 17 hours nimbi, and rain falling, at 18 hours only a spitting of rain.
		16	28.911	67	56	45	S W	...	...	
	9th	9-30	29.009	58	56	87	Calm	...	0.16	{ Sky overcast at 6-30 & rain falling & continued to fall till 12, heavy short shower at 17 hours and again at 18-30 and slight hail at this last fall, rain again at 22 & 24 hours.
		16	28.888	67	59	59	N W	...	...	
	10th	0-30	29.090	64	56	57	N W	...	0.66	{ Clear bright day.
		16	29.033	60	57	43	N W	...	...	
	11th	9-30	29.072	61	56	71	W	...	...	{ Few cirri. Sky clear at 16 hours.
		16	29.013	72	59	41	N W	...	...	
	12th	9-30	29.124	67	60	61	Calm	...	...	{ Nimbi at 12 hours in N. sky, slight rain at 13 hours, sky overcast at 16 hours.
		16	29.080	70	61	57	N W	...	...	
	13th	9-30	29.038	74	62	47	Calm	...	...	{ Cirri all the morning, condensed to nimbi at 20 hours, and rain fell.
		16	29.015	79	62	33	Calm	...	...	
	14th	9-30	28.914	75	60	36	S E	...	...	{ Cirri in the morning at 16 hours, nimbi, and followed by a few heavy showers & much thunder & lightning; at 20 hours heavy rain.
		16	28.953	79	61	30	N W	...	...	
DARJEELING.	8th	9-30	23.680	42	46	82	E S E	Light	...	Rather misty.
		16	23.687	49	43	57	W by S	Light	...	
	9th	9-30	23.270	42	40	82	S W	Light	...	Cirrocumuli, nimbi.
		16	23.207	47	44	77	W	Light	...	
	10th	9-30	23.362	42	39	74	W by S	Moderate	0.09	Ditto, frosty morning.
		16	23.148	43	44	70	W	Strong	0.04	
	11th	9-30	23.178	39	38	90	E by S	Light	0.35	Ditto, nimbi.
		16	23.156	46	44	84	N W	Light	...	
	12th	9-30	23.311	45	43	84	S E	Light	...	Ditto, ditto.
		16	23.276	45	44	93	W	Light	...	
	13th	9-30	23.276	45	43	84	W N W	Light	...	Dense mist.
		16	23.234	47	46	92	W N W	Light	...	
	14th	9-30	23.254	46	44	84	E S E	Light	...	Misty.
		16	23.215	50	48	85	W by S	Light	...	
PALAS POINT.	1st	9-30	29.823	76	71	77	N E	...	...	Light weather.
		16	29.893	80	71	62	E S E	...	...	
	2nd	9-30	29.893	78	72	73	S S E	...	...	Ditto.
		16	29.805	79	73	73	S S E	...	...	
	3rd	9-30	29.925	79	73	73	Variable	...	...	Ditto and fine.
		16	29.842	80	74	74	S S E	...	...	
	4th	9-30	29.898	78	72	73	S W	...	...	Ditto.
		16	29.763	80	74	74	S S E	...	...	
	5th	9-30	29.825	79	74	77	S W	...	...	Moderate breezes.
		16	29.691	81	76	78	S W	...	...	
	6th	9-30	29.815	79	77	90	Calm	...	...	Light weather.
		16	29.720	81	77	82	S E by S	...	...	
	7th	9-30	29.788	78	75	80	S W	...	...	Light winds and fine.
		16	29.684	76	73	86	N E	...	...	

STATION.	February.	Hour.	Barometer reduced to 32°.	THERMOMETER.		Humidity Sat. = 100.	WIND.		Rain.	WEATHER.
				Dry.	Wet.		Direction.	Velocity.		
			Inches.	⊖	⊖				Inches.	
PATNA.	6th	9-30	29.649	75	68	68	N W	...	...	} Rain during night.
		3-30	29.504	81	70	55	W	...	...	
	7th	9-30	29.713	70	54	30	N W	...	...	} Much colder.
		3-30	29.501	78	61	42	N W	...	...	
	8th	9-30	29.606	71	53	21	W	...	...	} Very cold all day.
		3-30	29.579	77	57	21	N W	...	...	
	9th	9-30	29.770	78	60	29	E S E	...	...	} Rain impending.
		3-30	29.635	79	61	30	E	...	...	
	10th	9-30	29.719	72	61	49	E	...	...	} Strong wind all day from East, with desultory thunder and heavy sprinkling of rain in the morning.
		3-30	29.570	82	69	48	E	...	...	
	11th	9-30	29.767	73	61	46	W	...	...	} Again cold with W. wind.
		3-30	29.674	79	58	23	N W	...	...	
	12th	9-30	29.791	75	60	36	N W	...	...	} Ditto ditto.
		3-30	29.726	81	59	19	W N W	...	...	

BENGAL SECRETARIAT, }  
The 21st March 1868. }

HENRY F. BLANFORD,  
Meteorological Reporter to Govt. of Bengal.





# SUPPLEMENT TO The Calcutta Gazette.

WEDNESDAY, APRIL 1, 1868.

## OFFICIAL PAPERS.

*Non-Subscribers to the GAZETTE may receive the SUPPLEMENT separately on a payment of six Rupees per annum if delivered in Calcutta, or twelve Rupees if sent by Post.*

### Circular issued by the Inspector-General of Jails, on the subject of arresting the spread of Cholera.

From F. J. MOUTAT, Esq., M. D., Inspector-General of Jails, Lower Provinces, to all Officers, Civil and Medical, connected with the Jails of the Lower Provinces, — (No. 1180, dated Alipore, the 4th March 1868.)

THE Cholera season being again at hand, I beg to solicit your earnest and careful attention to the Circular Orders enumerated

No. 30, dated 28th December 1855.  
" 51, " 20th September 1866.  
" 77, " 12th April 1868.  
" 141, " 7th March 1868.

ated in the margin, all of which are contained in Appendix XVIII, pp. ccx—ccxxxv. of my last Annual Report, and in the Bengal Jail Manual, Appendix I, pp. 19—25.

It is satisfactory to me to find after the lapse of so many years, during which public and professional attention has been frequently and forcibly directed to the subject of cholera, that the general directions which I issued in 1855 still contain nearly all the precautionary measures considered necessary or advisable to adopt against the invasion, or for the arrest of cholera.

The only important addition, which the sanitary adviser of the Crown in England lays stress upon, is the use of disinfectants.

Upon this subject I reprint and circulate for your information and guidance the subjoined Memorandum on Disinfection, promulgated by the Medical Officer of Her Majesty's Privy Council in 1866, and contained in his report on Public Health published in 1867.

#### MEMORANDUM ON DISINFECTION.

*It is to cleanliness, ventilation, and drainage, and the use of perfectly pure drinking water, that populations ought mainly to look for safety against nuisance and infection. Artificial disinfectants cannot properly supply the place of those essentials, for, except in a small and peculiar class of cases, they are of temporary or imperfect usefulness. That no house refuse, not only no excremental matter but also no other kind of dirt or refuse, should remain on or about inhabited premises, is a first rule against infection. That the air within the house should never*

*in any part of the house be stagnant, but should always be in course of renewal from without by uninterrupted and abundant supplies of fresh air, is a condition of equal importance. And that all water meant to be used for drinking or cooking should be drawn from sources which cannot have been polluted by any kind of refuse-matter, is a third most important rule for the avoidance of infection.*

*If dwelling-places have within them any odour of drainage, particular examination should be made (1) whether the filth which house-drains are meant to carry away is retained in or near the premises in ill-made drains, or sewers, or cesspools, or perhaps is leaking from house-drains within the house; and (2) whether inside the house the inlets of drains and sinks are properly trapped; and (3) whether the drains and sewers are sufficiently ventilated outside the house. All water-closets within houses should have free opening for ventilation from and into the outer air. Of a cesspool, the only true disinfection is to abolish it. In country places, where proper drainage is not provided, the nuisance of open privies may be best avoided by the use of the so-called earth-closet.*

*If a sewer is much complained of as stinking into the public way, generally the presumption is, that, from original ill-construction or some other cause, it does not properly fulfil its object, but has filth accumulated and stagnant in it; and such a sewer, besides occasioning nuisance in the public way may be the source of serious danger to the inhabitants of houses which drain into it. It is most important that all sewers should be well ventilated at points where their effluvia will be least injurious; and ordinary drain-pipes may be used to conduct the effluvia to a distance.*

*For artificial disinfection on a large scale, the agents which most commonly prove useful are—quicklime, chloride of lime, carbolic acid, sulphate of iron, perchloride of iron, and chloride of manganese. The following are also efficient disinfectants, but, as being dearer, are less suited for large operations: sulphate of zinc, chloride of zinc, chloride of soda, and permanganate of potash. In certain cases chlorine gas, or nitrous acid gas, or sulphurous acid gas, may advantageously be used;*

and, in certain other cases, powdered charcoal or fresh dry-earth.

*Quick-lime* ought to have been recently burnt, and may be used either in the form of dry powder, or stirred up with about ten times its bulk of water as milk of lime. *Chloride of lime* is best used with water, and thoroughly mixed with it, in the proportion of a pound to the gallon; or, of the solution, as commonly sold, about two pints may be mixed with a gallon of water. *Carbolic acid* (in the fluid form in which it is commonly sold) should be dissolved in about eighty times its volume of water, with which it must be mixed by strong shaking in a closed vessel. *Sulphate of iron* should be dissolved in ten times its weight of water; a solution which is best effected by employing hot water and stirring. Of *perchloride of iron* and *chloride of manganese*, the common concentrated solutions may be used, diluted with ten or twelve times their bulk of water. *Sulphate of zinc* should be dissolved in about ten times its weight of warm water. Of *chloride of zinc*, the common concentrated solution may be diluted with eight or ten times its bulk of water.\* Of *chloride of soda*, the common solution may be used like that of chloride of lime. Of *permanganate of potash*, an ounce may be dissolved in a gallon of water.†

All disinfectants must be used in quantities proportionate to the amount of matter or surface to be disinfected. When the matters requiring to be disinfected have an offensive smell, the disinfectant should be used till this smell has entirely ceased, and as often as the smell recurs, the disinfectant must again be used.

1. During the emptying of privies and cesspools, and whenever else temporary disinfection is required for them, carbolic acid, or sulphate of iron or perchloride of iron, or chloride of manganese, or chloride of zinc, will be found available. A dilute solution (as above) of one of those agents should be poured into the privy or cesspool, from a quart to a pailful at a time, till the desired effect is obtained. Especially where cholera or typhoid fever is present, privies and cesspools ought to be very frequently flooded in this manner. The best test of their being adequately disinfected is the entire absence of fecal or ammoniacal odour.

2. Heaps of manure or other filth, if it be for the time impracticable or inexpedient to remove them, should be covered, to the depth of two or three inches, with a layer of freshly burnt vegetable charcoal in powder. Freshly burnt lime may be used in the same way, but is less effective than charcoal. If neither charcoal nor lime be at hand, the filth should be covered with a layer, some inches thick, of clean dry earth. For a privy which has only solid contents, the same sort of treatment is applicable. Earth near dwellings, if it has become offensive or foul by the soakage of decaying animal or vegetable matter, should be treated on the same plan.

3. If running sewage, about to be used in agriculture, require to be disinfected, the chloride

of manganese or perchloride of iron may be best used;\* but if the sewage is to pass into a river, or into any pond or canal, where it might again become offensive, chloride of lime is to be preferred, and in this case a pound of good chloride of lime will generally suffice to disinfect 1,000 gallons of the sewage. For foul ditches and other stagnant drainage chloride of lime is also the proper disinfectant.

4. Where it is desirable to disinfect, before throwing away, the evacuations from the bowels of persons suffering from cholera or typhoid fever, some of the disinfectant (which here may best be chloride of lime) should be put into the bed-pan or other vessel before it is used by the patient, and some more should be added immediately after. Its thorough mixture with the evacuation should be ensured. Care should also be taken that portions of the discharges do not remain about the patient's body or in his dress.

5. Linen or Washing apparel requiring to be disinfected may be set to soak in water containing per gallon about an ounce either of the common clear solution of chloride of lime or of that of chloride of soda. Or the articles in question may be plunged into boiling water, and afterwards, when at wash, be actually boiled in the washing water.

6. Woollen, Bedding, or Clothing, which cannot be washed, may be disinfected by exposure for two or more hours, in chambers constructed for the purpose, to a temperature of F. 210-250. When this cannot be done, the natural disinfecting process of prolonged exposure to air, sun, and rain ought to be had recourse to.

7. For the disinfection of the interior of houses the ceilings and walls should be washed with warm quick lime water. The woodwork should be cleansed with soap and water, and subsequently washed with water containing in each gallon about two ounces of the clear solution of either chloride of lime or chloride of soda.

8. A room no longer occupied may be disinfected by chlorine gas, or nitrous acid gas, or sulphurous acid gas. And for this purpose the gases may be produced in the room as follows:—chlorine gas, by pouring over a quarter of a pound of finely powdered black oxide of manganese, contained in a jar, half a pint of muriatic acid previously mixed with a quarter of a pint of water; or by pouring over a quarter of a pound of chloride of lime, contained in a jar, a quarter of a pint of muriatic or dilute sulphuric acid;—nitrous acid gas by pouring over an ounce of copper shavings or turnings, contained in a deep jar, three ounces of concentrated nitric acid;—sulphurous acid gas, by burning an ounce or two of flowers of sulphur in a pipkin. The process of disinfecting a room by any of these gases requires several hours; and while it is going on, all doors, chimneys, and windows of the room must be kept carefully closed. Precautions to this effect should have been taken before the chemicals are mixed, as the persons who starts the process (having to avoid the gases) must not afterwards loiter in the room. When the process is at an end, doors and windows should be fully opened.

\* \* \* \*

JOHN SPENCER

For convenience in this memorandum, the word "disinfectants" is used to cover, not only those true disinfectants which permanently destroy infective matter, but also those agents which merely arrest the process, or absorb the offensive products of organic decomposition.

\* Or the preparations respectively known as Burnett's and Crew's disinfectant solutions may be employed.

† Or Condy's disinfectant fluids, which contain manganic and permanganic salts, may be used.

\* In some such cases McDougall's process, as practised by him at Carlisle, may be applicable, and his process may also be applicable to cases mentioned in § 1.

Several of Mr. Simon's suggestions are not applicable to Indian jails, but they are all valuable, hence I have not omitted any of them.

I am of opinion that fresh, dry, finely pounded garden mould, or earth containing organic matter, is not only the best and most efficient of disinfectants but it is the most permanent in its effects, is universally procurable, costs nothing, and needs only to be applied with care and attention to be thoroughly efficacious. To be of any real use it should be applied at once in sufficient quantity, thoroughly mixed, and the deodorized and disinfected dejecta be buried in trenches at a sufficient distance from the jail or encampment, *before putrefactive fermentation has begun.*

I do not myself attach so much importance to mere disinfection as some others do and have done; and Mr. Simon has shown that the conclusions of Dr. Budd of Bristol have not been verified by other observers.

Nevertheless, it is advisable that all excrementitious matters, whether choleraic or not, should be deodorized, removed, and buried as quickly as possible—and these measures are more imperative during the cholera season than at any other time.

The following additional remarks of Mr. Simon are also deserving of your most careful attention, and as his reports are not generally accessible in India, I reproduce them in extenso.

In relation to Asiatic cholera, as now threatening us, there are two principal dangers against which extreme and exceptional vigilance ought to be used.—First, there is the danger of drinking water which is in any (even the slightest) degree tainted by house-refuse or other like kinds of filth: as where there is outflow, leakage or filtration, from sewers, house-drains, privies, cesspools, foul ditches, or the like into streams, springs or wells from which the supply of water is drawn or into the subsoil in which the wells are situated: a danger which may exist on a small scale, as at the pump or dip-well of a private house, or on a large scale, as in the sources of supply of public water-works: And secondly, there is the danger of breathing air which is made foul with effluvia from the same sorts of impurity. Information as to the high degree in which those two dangers affect the public health in ordinary times, and as to the extreme degree of importance which attaches to them at times when any diarrhoeal disease is epidemic, has now for so many years been set before the public, by this Department and otherwise, that the larger works of drainage and water-supply by which the dangers are permanently obviated for large populations, and also the minor structural improvements by which separate households are secured against the dangers, ought long ago to have come into universal use. It is to be feared that on a very large scale this wiser course has not been adopted, and that even yet, in very many instances, temporary security has to be found in measures of a palliative kind. So far as such is the case, attention is most earnestly called to those parts of the General Memorandum which relate to the matters in hand. All chief sources of the one danger may be held in check as follows:—by immediate thorough removal of every sort of house-refuse and other filth which is now accumulated; by preventing future accumulations of the same sort; by attention to all defects of house-drains and sinks through which offensive

smells are let into houses; by thorough washing and lime-whiting of uncleanly premises, especially of such as are densely occupied; and by disinfection, very freely and very frequently employed, in and round about houses, wherever there are receptacles or conduits of filth, wherever there is filth-sodden porous earth, wherever anything else, in, or under, or about the house tends to make the atmosphere foul. As provisions against the other danger, it is essential that immediate and searching examination of sources of water-supply should be made in all cases where the source is in any degree open to the suspicion of impurity: examination both of private and of public supplies; and that where pollution is discovered, everything practicable should be done to prevent the pollution from continuing, or, if this object cannot be attained, to prevent the water from being drunk. The examination of sources of water-supply should of course extend to all receptacles of water storage, such as the tanks and reservoirs of public supply, and the butts and cisterns of private houses.\*

That such precautions as the above (never unimportant where human health is to be preserved) are supremely important when spread of cholera is to be prevented, is a truth which will best be understood when the manner in which cholera spreads is considered. Happily for mankind, cholera is so little contagious, in the sense in which small-pox and typhus are commonly called contagious, that, if proper precautions are taken where it is present, there is scarcely any risk that the disease will spread to persons who nurse and otherwise closely attend upon the sick. But cholera has a certain peculiar contagiousness of its own, now to be explained; which, where sanitary circumstances are bad, can operate with terrible force, and at considerable distances from the sick. It appears to be characteristic of cholera—not only of the disease in its developed and alarming form, but equally of the slightest diarrhoea which the epidemic influence can produce, that *all matters which the patient discharges from his stomach and bowels are infective*; that the patient's power of infecting other persons is represented almost or quite exclusively by those discharges; that they, however, are comparatively non-infective at the moment when they are discharged, but afterwards while undergoing decomposition, acquire their maximum of infective power; that if they be cast away without previous disinfection, they impart their own infective quality to the excremental matters with which they mingle, in filth-sodden earth or in depositories and conduits of filth, and to the effluvia which those excremental matters evolve; that, if the infective material, by leakage

\* If unfortunately the only water which for a time can be got should be open to suspicion of dangerous organic impurity, it ought at least to be boiled before it is used for drinking, but then not to be drunk later than twenty-four hours after it has been boiled. Or, under medical or other skilled direction, water, in quantities sufficient for one day's drinking in the house, may be disinfected by a very careful use of Condy's red disinfectant fluid. This should be added to the water (with stirring or shaking) such number of drops that the water an hour afterwards, shall have the faintest pink colour which the eye can distinctly perceive. Filtering of the ordinary kind cannot by itself be trusted to purify water, but is a good addition to either of the above processes. It cannot be too distinctly understood, that dangerous qualities of water are not obviated by the addition of wine or spirits.



or soakage from drains or cesspools, or otherwise gets access, even in smallest quantity, directly or through porous soil, to wells or other sources of drinking-water, it can infect, in the most dangerous manner, very large volumes of the water; that the infective influence of choleraic discharges attaches to whatever bedding, clothing, towels, and like things, have been imbued with them, and renders these things, if not disinfected, capable (as the cholera-patient himself would be capable, under the same conditions) of spreading the disease in places whither they are sent for washing or other purposes; that, in the above described ways, even a single case of disease, perhaps of the slightest degree, and perhaps quite unsuspected in its neighbourhood, may, if local circumstances co-operate, exert a terribly infective power on considerable masses of population. "If local circumstances co-operate, however, is the stated condition for that possibility; and it will be observed that the essence of the sanitary precautions, which have been recommended to Nuisance Authorities and others, is to annihilate those 'local circumstances.' The choleraic infection does not seem able largely to injure population unless a filthy state of things be pre-supposed. It is pre-supposed that the atmosphere or the drinking-water of the population is impure with the most loathsome of impurities,—that the infective material has had opportunities of action which decent cleanliness would not have afforded it,—that, in inefficient drains or cesspools other like depositories, it has had time to develop its own infective power, and to render other stagnating filth equally infective with itself,—and that, from such foci of infection, the disgusting leaven of the disease has spread, in air and water, to be breathed or swallowed by the population. In this view of the case, it will be understood that works of sewerage, house-drainage, and water-supply, properly executed and properly used, give to town populations an almost absolute security that cholera, if introduced among them, can have no means of spreading its infection. And equally it will be understood that, in the absence of those permanent safeguards, no approach to such security can be got without incessant cleansings and disinfections, or without extreme vigilance against every possible contamination of drinking-water."

I am satisfied that the influence of water in the propagation of cholera has been considerably over-rated, and that we have still much to learn on the subject. For example, I ascertained recently at Pooree that, although the water-supply of that town is polluted to the last degree by choleraic matters—whether vomited or otherwise evacuated—it is used for all domestic purposes, without boiling, filtration, or any process of depuration, and very rarely causes attacks of cholera to the towns-people. Again, while the water in the tanks and wells of Pooree is loaded with choleraic matters in the greatest degree, and consumed by the fixed population of the place, cholera disappears, taking flight with the departure of the pilgrims—and the tainted water ceases to exert any further injurious influence. I hold it nevertheless to be difficult to exaggerate the importance of careful attention to the above injunctions, and it is in the power of all Officers in charge of Indian jails to enforce the most constant and unvarying obedience to them. Should any such Officer fail in this duty, he will incur a very serious personal responsibility, but I have

no reason to suppose that it will not receive immediate and earnest attention,\* and I am satisfied that where the jail is not in the administrative charge of a Medical Officer, the Civil Surgeon will cordially assist in the great prophylactic measures enjoined.

Upon the urgent necessity of a most careful scientific study of cholera on the part of the Civil Surgeons of Bengal I do not touch, because the purely professional concerns of the jails are not under my control. They will doubtless receive special instructions on the subject from the proper authorities.

"It is now well known" says Mr. Simon in his last report "that cholera and typhoid fever, and other endemic bowel affections, stand in intimate etiological relation to the pollution of air and soil and water with decaying excremental matters." The prevention of such pollution is the best general means of protection that can be attempted. It is to secure this important end that I issue the present Circular.

In recording the incidents and results of the out-breaks of cholera that may occur in the jails under my charge during the present year, the attention of the Medical Officers of Lower Bengal is particularly requested to the following branches of enquiry: "(1) a careful record of the different modes of treatment of cholera practised: (2) study of the *chemical changes* undergone by the body in cholera, and of the relations subsisting between these changes and the symptoms which the patients present during life: (3) similar study, chiefly microscopical of the *successive anatomical changes* of the affected body: (4) verification of alleged proofs of the *communicability of cholera*: (5) collection of facts, in the line of study opened by Professor V. Pettenkofer of Munich, as to the non-coincidence of local epidemics of cholera with such conditions of the local ground-water as are indicated by a full state of surface wells."

### On the Prevalence of Epidemic Fevers in the Districts adjoining Calcutta

From E. C. BAYLEY, Esq., Secretary to the Government of India, Home Department, to H. L. DAMPIER, Esq., Officiating Secretary to the Government of Bengal, (No. 2822, dated Simla, the 27th July 1867.)

AN attentive perusal of the history, as given in the Administration Reports of the Government of Bengal, of the epidemic fever which has since 1861 annually prevailed in the districts surrounding Calcutta, has convinced the Governor General in Council that the terrible suffering and mortality caused by it will in all probability recur sooner or later (if, indeed, it has now ceased), and again and again with increased virulence, unless efficient preventive measures are promptly carried out. I am therefore directed to invite serious and immediate attention of His Honor the Lieutenant-Governor to the following remarks:

2. The report of the Commission appointed in January 1864 by the late Lieutenant-Governor, to enquire into the causes of the fever, describes the state of the villages to be such as justifies the wonder expressed that the people had not suffered even more extensively, but does not, I am to observe, satisfactorily account for the fact that

\* Ninth Report of the Medical Officer of the Privy Council for 1866, p. 22.



all the causes of disease mentioned by the Commission have been for years at work in many places, which until lately have never suffered and are still in operation in many places yet free from sickness. The only new cause suggested by the native member of the Commission, Baboo Digumbar Mitter, as probably increasing the dampness which the Commission considered to be the main source of disease, was the obstruction to drainage by railways and roads, and the shutting up of outlets into rivers. Lieutenant Hills of the Public Works Department was accordingly deputed to report fully on the drainage of the country, and to propose a general scheme for its improvement with special reference to Baboo Digumbar Mitter's suggestion. In his final report, submitted in December 1861, Lieutenant Hills distinctly asserted that the Eastern Bengal Railway had not affected the drainage, and he specially mentioned some points of importance on which more or less action was taken. The report, however, contained no such comprehensive scheme as had been expected, nor is it known what was done in execution of the orders passed upon it, nor whether on the removal of Lieutenant Hills, after the submission of his report, a successor was appointed. On all these points His Excellency in Council considers that full and early information should be procured, and I am directed to request that if, in His Honor's opinion, the District Engineer has not sufficient leisure to complete the task which was left unfinished by Lieutenant Hills, an Officer may be carefully selected for the purpose. The Governor General in Council would wish to see any information that is now available or that may be collected hereafter.

3. But I am to observe, whatever may have been the primary cause of the epidemic in 1861, there can be no doubt that the miasma generated by damp, decaying vegetation, imperfect ventilation, and polluted drinking water had a powerful effect in preparing for its outbreak and increasing its violence, or that so long as villages remain in the condition described by the Commission, their liability to the ravages of a most fatal epidemic must continue. It is therefore of urgent importance that whatever ulterior measures may be taken for the general improvement of the country, the simple sanitary measures recommended by the Commission should be carried out in every village. It is undoubtedly the duty of the landowners and villagers to give effect to these local measures, but there is little hope that they will do so, unless stimulated by an interest in their welfare shown by the Government and its Officers, and taught to work methodically.

4. The Lieutenant-Governor can best decide in what manner the interest felt by the Government can be most beneficially evinced, and of what nature its guidance should be. I am to suggest however, for His Honor's consideration, that the Commissioners and District Officers might be requested to urge upon zemindars and villagers, in public meeting and private visits, the necessity for exertion, to point out to them that the fever will almost certainly return, and the ease with which a village might be cleared, before its inhabitants are swept off or prostrated, and to explain to them the efficacy of the measures urged upon them towards removing the dampness which Bengalees well know to be a cause of fever. Should His Honor the Lieutenant-Governor concur in the views now expressed,

the suggestions of the Commission might be epitomized and translated into Bengalee for village circulation, and in order to methodize operations and continue the stimulus until the completion of the work, the villages effected and those in their neighbourhood might be divided into circles of convenient size, each to be placed in charge of a Deputy or Assistant Magistrate or Collector. This Officer might be required to encamp in his circle during the cold weather, and visit it frequently at other seasons till nothing remained to be done, when a fresh circle might be made over to him. The Magistrate and Collector should, as a matter of course, visit the circles as frequently as possible to encourage and advise with the people, and see that the Officer in charge obtained and directed their hearty co-operation. After the completion of the work in the circles first formed, others outside them might be successively told off, and a district thus gradually cleared. To prevent relapse the circle system could be kept up, each being periodically inspected by some Officer, and gradually one or two villagers might in each perhaps be induced to share in the inspection and regulation of its sanitary affairs.

5. The Governor General in Council desires me to suggest, for the consideration of the Hon'ble the Lieutenant-Governor, whether the British Indian Association might not with advantage be again invited to co-operate, as he trusts that the unfavorable opinion of sanitary measures, which it recorded previously to the receipt of the report of the Fever Commission, may have been modified.

6. His Excellency in Council trusts that the system now suggested or something similar will be heartily and perseveringly carried out, and that progress will not be retarded by frequent changes of the Officers who may be selected in each district as best fitted for the purpose. Success, however slow at first, must, it is believed, eventually attend this and every scheme which intimately connects the Officers of Government with the welfare of the people, and evinces a deeper interest in their private life than can be shown in courts and treasuries.

7. I am to observe, however, that action should not be confined to these merely village measures. The Officer who may be selected, under the instructions conveyed in paragraph 2 of this letter, should carefully compare the present with the previous condition of the country, so as to ascertain whether it has undergone any such change as will account for the outbreak of the epidemic at the particular period of its occurrence, by the aggravation of the various and long existing evils of the villages into sudden and violent action.

8. I am directed to suggest three points, to which the investigation might be specially directed—

I.—Whether there is any considerable obstruction to general and not merely village drainage.

II.—Whether the growth of jungle or of high and closely cultivated vegetation has largely increased in or near the villages.

III.—Whether any change in the circumstances of the people has deprived them of the same quantity and quality of food and clothing as they formerly enjoyed.

From A. P. HOWELL, Esq., Under-Secretary to the Government of India, Home Department,—(No. 1616, dated Fort William, the 21st December 1867.)

FORWARDED to the Government of Bengal in continuation of this Office letter No. 2822, dated the 27th July 1867, and attention requested to paragraph 3.

From the RIGHT HON'BLE SIR STAFFORD H. NORTHCOTE, Bart., M. P., Her Majesty's Secretary of State for India, to His Excellency the Right Hon'ble the Governor General of India in Council,—(No. 148, dated India Office, London, the 8th November 1867.)

PARA. 1.—The Despatch of your Government, No. 144 of the 10th August last, on the subject of the epidemic fever which has, since 1861, annually prevailed in the districts surrounding Calcutta, has been considered by me in Council.

2. The prevalence of a very fatal epidemic in certain districts of the Nuddea and Burdwan Divisions, reported in the letter from your Government of the 22nd April 1863, No. 25, formed the subject of Sir C. Wood's Despatch of the 9th July 1863, No. 48, in which grants from the local funds were sanctioned in order to stimulate and encourage the people themselves not to neglect sanitary measures, and the provision of proper medical advice and medicines within the reach of the villages where the epidemic prevails was suggested.

3. I shall await with interest the further proceedings of your Government consequent on the communication which you have caused to be made to the Bengal Government, (No. 2822, dated 27th July 1867), the several suggestions contained in which seem to me to be well calculated to prevent a recurrence of the fever.

From H. L. DAMPIER, Esq., Officiating Secretary to the Government of Bengal, to the Secretary to the Government of India, Home Department,—(No. 286, dated Fort William, the 16th January 1868.)

I AM directed to acknowledge the receipt of your letter No. 2822, dated the 27th July, in which the attention of the Lieutenant-Governor is invited to the necessity of adopting measures for the purpose of preventing the continuance or recurrence of the epidemic fever which has prevailed at intervals since 1861 in the districts adjoining Calcutta.

2. This fever, as the Governor General in Council is aware, engaged the anxious attention of the Local Government in 1863 and 1864. It would seem that, after the cyclone of October in 1864, the malady almost entirely disappeared, and that during 1865 there was no return of it, or at least none such as to attract attention. During 1866 and 1867, however, the fever has again attacked portions of the same districts, though not, it is believed, with the extreme violence that it did in 1862 and 1863. On receipt of your letter a further enquiry has been made from the Commissioners of Burdwan and Nuddea and from the Public Works Department in order to obtain the latest information procurable in answer to the enquiries made in your 2nd paragraph.

3. Lieutenant Hills submitted his final report in December 1864. A copy of the letter of the Commissioner of Nuddea, No. 49Ct., dated 18th March 1865, forwarding that report for the information of Government, as well as a copy of the

instructions given by the Commissioner to Lieutenant Hills on the 1st September 1864, (No. 127,) is forwarded herewith, although the papers have evidently been seen by the Governor General in Council. From these papers the action taken by the Commissioner on receipt of Lieutenant Hills' report will be seen. The orders passed by the Commissioner were approved by the Lieutenant-Governor on the 3rd July 1865,\*

\* No. 178T.

and on the 23rd of October the Officiating Commissioner, Mr. Shore, requested sanction to certain expenditure connected with the preventive operations in the 24 Pergunnahs, promising† a further application of a similar kind

† No. 243, dated 23rd October.

for the district of Nuddea. The sum applied for (Rupees 4,688-6) was sanctioned on the condition that half the cost of all works undertaken should be defrayed from

‡ No. 6361, dated 8th November 1865. local subscriptions,‡ and on the

14th April 1866 the Commissioner submitted a report of the sanitary operations which had been carried out in the 24 Pergunnahs up to the 31st October 1865. From this report,§ copy of which

§ No. 26, dated 14th April 1866.

is annexed, it will be seen that certain minor conservancy operations were undertaken in the Sub-Divisions of Barrackpore, Dum Dum, and Baraset, at a total cost to Government of Rupees 1,009-14-6, but that the drainage of the bheel near Halee-shubur, for which Rupees 800 had been sanctioned, fell through owing to the difficulty of obtaining the services of a competent Engineer.

4. No report had been received from the Commissioner of Nuddea subsequent to that of the 14th April 1866 until the receipt of your letter under acknowledgment, on which further information has been called for in the letters of this Office marginally noted. The

|| No. 3547, dated 14th August 1867. 17th September.  
¶ No. 289, dated 19th September.

reply of the Commissioner to the first of these has been received and is forwarded; it will be seen that in some villages the recommendations of Lieutenant Hills were apparently carried out, while in others they were found impracticable or fell through owing to Lieutenant Hills' transfer, but on the whole the Lieutenant-Governor fears that little or no substantial improvements were effected. I am directed to invite attention to the remarks of the Magistrate of Nuddea in the enclosure to this letter regarding the village of Kanchraparah, in which the Officiating Commissioner concurs. The Lieutenant-Governor is of opinion that the apparent necessity for doing something in the face of a visitation, such as the epidemic, has led to the hasty execution of many operations which have been too partial and not directed with sufficient system to effect any permanent benefit, but which have nevertheless involved much harassment of the inhabitants and no considerable expenditure of public and private money.

5. The suggestion made by the Commissioner of Nuddea in the 7th paragraph of his letter of the 18th March 1865, that the excavations at the sides of roads should be so cut out as to be available as drains for the country generally did not meet the approval of the Officers of the Public Works Department. The Lieutenant-Governor



regrets that it should have been pronounced impracticable, as the adoption of it would, in a great measure, have met the objection which has been raised\* to the obstruction

\* See paragraph 21 of Appendix II. to the Report of the Commissioners in March 1864, being part of a memorandum by Baboo Dighunbur Mitter.

to local drainage caused by roads and railroads. It is said that even where sufficient water-way is left by the construction of numerous culverts for the larger drains and water-courses, still the embankments of these roads necessarily interfere with the natural flow of the drainage in its earlier stages from field to field, before it reaches the larger drains and khals; and that experience has shewn that such obstructions in the earlier stages are even more injurious to health than those in the later stages. It is evident that if the excavations at the sides of the roads could be constructed so as to act as water courses, that the above objections would be entirely met, and the drainage facilitated rather than obstructed. As the difficulties raised by the Superintending Engineer do not appear to be insuperable, His Honor proposes to re-open the question and enquire into its practicability.

6. The Lieutenant-Governor considers that it is to be regretted that Lieutenant Hills did not carry out more completely the most important of the instructions given to him by the Commissioner—that for which the services of a Professional Officer were more immediately requisite, viz., the preparation of a comprehensive scheme of drainage for the districts attacked by the epidemic. Perhaps his sudden transfer to Assam made this impossible, but it must be admitted that the results of his labors, as they stand, are altogether disproportionate to the benefit which might have been expected from the special appointment of an Engineer Officer; in fact, most of the petty local improvements which were recommended by him, and carried out by the Civil Officers were such as might have been suggested by any person who went round the villages. On Lieutenant Hills' transfer after the submission of his report no successor was appointed. In reply to your enquiry, I

† The Lieutenant-Governor presumes that by this is meant the Divisional Executive Engineer. There is certainly no Officer attached locally to each district whose qualifications as an Engineer would make it prudent to trust to him for a report on which it should be intended to base a general scheme of drainage, or to pronounce a definite conclusion as to the effect produced on the drainage of the district by Railway and Road embankments.

am directed to say that the Lieutenant-Governor is decidedly of opinion that the District Engineer could not possibly prepare such a scheme as is required while carrying on his ordinary duties. His Honor would be glad to appoint an Officer for this purpose, which he regards as of the highest importance, but he is quite unable to do so from the staff now at his disposal, that being already insufficient for the work devolving on it, which has been much increased by the special operations connected with irrigation and embankments in Cuttack and elsewhere. I am therefore directed to request that a special appointment for the purpose may be sanctioned, and an additional Officer of Engineers be placed at the disposal of the Lieutenant-Governor.

7. Simultaneously with the appointment of Lieutenant Hills to report on the drainage, &c., on the east bank of the Hooghly, Mr. Ducas, C. E., was appointed to prosecute similar enquiries

in the Burdwan Division of the western bank of that river. The accompanying report\* from the Commissioner of Burdwan will shew that the result of his mission was even more unsatisfactory than that of Lieutenant Hills. What Mr. Ducas, in the 12th paragraph of his report, terms the levelling operations, which he states his inability to carry out, formed perhaps the only part of the work entrusted to him to which any great importance was attached by Government or for which the services of a Professional Engineer were requisite. It will be observed, however, that in this Division particularly, as well as in the country generally, the attention of the authorities was diverted from the epidemic by the cyclone of 1864, which occurred only a few weeks after Mr. Ducas had been appointed. One of the most marked effects of the storm was the almost complete removal of the epidemic fever from all the villages in Hooghly and Burdwan which had previously been suffering from it. Mr. Ducas on the occurrence of the cyclone was at once deputed to Tumlook, and had no further opportunity of making observations. His report, which is of little value, will be found as an enclosure to the Commissioner's letter of the 25th October, while a copy of his journal during his visit will be found attached to the docket of the Public Works Branch of this Office, No. 253C., dated 25th October last. After his departure no successor was appointed. If any Officer be now appointed, as recommended above in the 6th paragraph of this letter, the Lieutenant-Governor is of opinion that the western as well as the eastern bank of the Hooghly should be included in the field of his enquiries.

\* No. 155, dated 25th October.

8. The report of the Commissioner of Burdwan further shews that some clearing operations were also undertaken in that Division, and that in the Commissioner's opinion they were in some instances, especially in the neighbourhood of the town of Hooghly, where they were carried out with great energy and persistence by the Officiating Magistrate, Mr. R. V. Cockerell, productive of good results. The Lieutenant-Governor, however, would observe that on this point a diversity of opinion prevails, and that the epidemic appears to have left simultaneously places where clearing operations had not been carried out and those where they had been; and that it had previously been as impartial in its attacks on towns and villages in which the sanitary conditions had been comparatively good, as on those where they had been the worst.

9. The Lieutenant-Governor observes that the Governor General in Council attaches great importance to the inauguration of a general system of sanitation throughout the affected districts; and it is directed, in the third and subsequent paragraphs of your letter under reply, that steps should be taken on the part of the Local Government to exercise a more thorough supervision over the towns and villages in the interior, dividing them into Circles, and placing each Circle under the charge and inspection of a subordinate Magistrate, who should encamp in his Circle during the cold weather, and visit it frequently at other seasons, till no sanitary improvements remained undone, after which a fresh Circle should be made over to him.

10. In replying to these paragraphs the Lieutenant-Governor directs me in the first place to point out that many of the suggestions contained in them have been already carried out.

Letter from Honorary Secretary, British Indian Association, dated 28th September 1864.

Reply to Honorary Secretary, British Indian Association, No. 4273, dated 17th October 1864.

Letter to Honorary Secretary, British Indian Association, No. 3549, dated 14th August 1867.

Reply thereto, dated 30th August.

The recommendations of the Commissioner were translated into Bengalee by the British Indian Association and circulated extensively

among the inhabitants of the affected districts. The correspondence marginally noted shews the action of the Government in this respect, and the reply of the Association dated the 30th August last, giving their present views, is deserving of attention. Similarly, I am to observe, that the suggestion that Commissioners and District Officers should hold private and public meetings and personally impress upon the zemindars and villagers the importance of sanitary measures has already been fully acted upon, and that several meetings of this description have been held in the principal places of the affected districts and subscriptions raised for the performance of clearing operations.

11. The remaining suggestion, that of assigning Circles to subordinate Magistrates, and of adopting systematic sanitary measures under their superintendence, was also carried out for some time in 1863-64, especially in the Nuddea Division in which those portions of the 24-Pergunnahs and Nuddea affected by the epidemic were for some time parcelled out into small Circles and worked exactly in the manner suggested.

12. In discussing the desirability of resuming sanitary operations on a larger scale, the Lieutenant-Governor desires to draw a distinction between drainage and other sanitary measures in the interior. Whether well founded or not, the belief is universal among the inhabitants of the localities which have been visited by the epidemic that it has been partially or entirely due to defective drainage caused by a change in the drainage conditions of the country arising from the construction of roads and railroads. Hardly a week passes without some comment to this effect in the native papers, and His Honor is confident that in carrying out any operations for the purpose of ascertaining whether the drainage of the country is or is not at present seriously defective, the Officers of Government will receive the co-operation of the zemindars and other inhabitants. It is on this account the more to be regretted that this important question was so insufficiently attended to by both Engineer Officers who were appointed in 1864. On the other hand, though the Lieutenant-Governor fully admits the very unsatisfactory sanitary condition of Bengalee villages as well in other districts of the Lower Provinces as in those which have been visited by the epidemic, he must remark that hitherto no valid grounds have been shewn for concluding with any confidence either that the affected villages are more overgrown with jungle and rank vegetation than was formerly the case, or that the out-breaks of the epidemic were in any way connected with this cause. He is confident that this is the opinion of the natives themselves in general, and the annoyance, vexation, and expense to which clearing operations, which have to be constantly repeated, expose them, are so great

that His Honor is bound to express his conviction that any hasty or indiscriminate efforts on the part of Government Officers to enforce such measures will bring them into total conflict with the feelings and wishes of the population, and will lead to a passive opposition on their part to all sanitary improvements.

13. The Lieutenant-Governor has no doubt that a system, such as that proposed in your letter, of dividing the country into Circles and placing each Circle under a separate Officer, might be easily set on foot by the Local Government, and a certain amount of energy on the part of Local Officers called into play. The more sanguine of these Officers would furnish highly encouraging progress reports, and for a time the most satisfactory results would be confidently anticipated, but His Honor is fully persuaded that while such operations would certainly entailed great expense on the inhabitants and on Government, and would cause very great discontent generally, they would be attended, on any scale on which they can practically be carried out, with hardly any appreciable benefit. This, as far as can be ascertained, is not only the opinion of the late Magistrate of Nuddea, Mr. Grey, and of the Officiating Commissioner of the Presidency Division, as shewn in the enclosures to this letter, but also of the great majority of Local Officers who have had any experience of sanitary measures in the epidemic districts. It must especially be borne in mind that under the conditions of Lower Bengal any clearance of spontaneous vegetation, however thorough, is of the most transient effect only: To cut down the jungle and underwood is worse than useless; to root it up is extremely laborious and costly; and even when uprooted it is replaced by a no less luxuriant growth in the course of one or two rainy seasons. So that the question is not one of thoroughly clearing the villages once for all. To be effectual, active and organized measures must be continuous.

14. To keep up such operations with any appreciable efficiency and in the teeth of the people throughout the length and breadth of the districts which have been affected by the epidemic is, in the Lieutenant-Governor's opinion, impracticable. If they are to be undertaken, His Honor would much prefer to introduce them vigorously and carry them out thoroughly and continuously in a few selected centres of population as an experiment. Even for this purpose the Government must be prepared to incur a heavy expense; it is useless to deny that subscriptions which the people are called upon to raise for this purpose are unwillingly and grudgingly given, and that the effective superintendence of such operations is entirely beyond the powers of the present staff of Officers in the Mofussil whose time is more than fully occupied already by the multifarious duties which are imposed upon them, and which have been so materially augmented of late years. Should His Excellency the Governor General in Council still be of opinion that the work should be undertaken, the Lieutenant-Governor trusts that he may be authorized to entertain a staff of special Officers for the purpose, or for performing the duties of the existing staff who will be drawn away from their ordinary duties.

15. But, for the reasons above indicated, the Lieutenant-Governor hopes that beyond such temporary measures as are called for by local circumstances, no action may be taken on a more



extended scale until the general report on the drainage of the country shall have been received from the Officer who may be appointed in accordance with paragraph 2 of your letter under reply. On the appointment of such an Officer, His Honor will carefully prepare instructions for his guidance, which, if desired, may be submitted for the approval of His Excellency in Council, and which drawn up will leave no excuse to the Officer who may be appointed, to neglect that portion of his work—an enquiry into the conditions of the general drainage of the country—which is, in His Honor's opinion, of by far the greatest importance.

16. The further report of the Commissioner of the Presidency Division, in reply to the letter of this Office, dated 17th September, and any further reports of interest on the subject, together with any action taken thereon by the Lieutenant-Governor, will be forwarded for the information of the Government of India hereafter.

From E. C. BAYLEY, Esq., Secretary to the Government of India, Home Department, to the Officiating Secretary to the Government of Bengal,—(No. 867, dated Fort William, the 21st February 1868.)

I AM directed to acknowledge the receipt of your letter No. 286, dated the 16th ultimo, with its enclosures, and in reply to communicate the following observations.

2. The papers submitted do not throw any satisfactory light on the causes of the fatal epidemic which ravaged the districts about Calcutta prior to the cyclone of 1864. The cyclone, from the effects of which, in strewing the country with decayed vegetation, an aggravation of the epidemic was apparently apprehended, had the directly contrary effect. The history of the epidemic itself is equally strange. It is shown to have been unaccountably capricious and fitful in its incidence, seizing indiscriminately on towns whose sanitary arrangements were the best, and others where sanitation was quite neglected, and entirely over-leaping tracts which there was every reason to suppose most liable to its attacks.

3. There is, His Excellency in Council thinks, much reason in what the Lieutenant-Governor urges as to the inexpediency of forcing on the people measures of clearance that are evidently inconsistent with the climatic conditions of Bengal. It is not the over-growth of vegetation, which indeed it would be beyond any human contrivance to remove, that has apparently produced the fever or nourished it; the country has always abounded in this luxuriant and rank growth and without bad effects. It is no doubt important that within, and on the borders of, populous villages and towns attention should be directed towards a certain degree of clearance, and towards

the avoidance in their vicinity of heaps of decaying matter; and this it is the duty of the Magisterial Officers to urge upon the people. But as to more extensive measures, there is the danger of zealous Officers imposing an amount of vexation and expense upon the people for, possibly, no appreciable benefit whatever. A good Magistrate will seek to carry the people with him, and gradually purge and improve the thickly populated villages and towns.

4. The Governor General in Council is well content that it should be left to the Lieutenant-Governor to decide, in communication with the Sanitary Commissioner about to be appointed for the Lower Provinces, to what extent such work of clearance is expedient and can be safely insisted upon, and what steps are necessary to carry it out.

5. But there is, in the opinion of the Governor General in Council, one point still requiring investigation; and that is, whether the system of Roads and Railways has really affected injuriously the drainage of the country. The opinion of Engineers is that it has not; and that, on the assumption that a sufficiency of cross-drainage has been afforded, it could not materially check the natural flow. This opinion, *on the assumption noticed*, seems to His Excellency in Council to be correct. But the Lieutenant-Governor thinks that there ought likewise to be *longitudinal* drainage by escape-cuts provided alongside the Road or Railway. It must be but rarely, the Governor General in Council apprehends, that this could be necessary, as almost all Roads and Railways are on raised embankments in Bengal, and though, therefore, depressions and tanks may be formed at the sides containing water, the retention is purely local, and no heaps or transverse embankments are thrown up to impede the longitudinal flow of the water. If, therefore, culverts and bridges are provided in sufficient number across the Road or Railway, there ought to be no impediment to the general drainage of the country. But as the point has been raised, it would be satisfactory to have the facts investigated by a competent Engineer Officer.

6. The Governor General in Council does not see that there would be any advantage in having, at the present moment, a more extended survey of the drainage conditions of Bengal. The subject is too large to be satisfactorily disposed of by the deputation of a single Officer: it is the duty of District Officers and District Engineers to keep their eye upon the general drainage of the country, and to watch where it is defective, and from time to time to suggest plans for remedying what is wrong.

7. The Public Works Department will be moved to provide a suitable Officer to examine and report on the alleged evil effect of the Roads and Railways on the drainage.

## Meteorological Report up to 21st March 1868.

STATIONS.	March.	Hour.	Barometer reduced to 32°.	THERMOMETER.		Humidity Sat. = 100.	WIND.		Rain.	WEATHER.
				Dry.	Wet.		Direction.	Velocity.		
			Inches.	°	°				Inches.	
CALCUTTA.	15th	10	29.924	81	76	78	S by W	...	...	Scattered cirrocumuli.
	16	16	29.780	80	79	69	S	...	...	Covered strati.
	16th	10	29.976	78	73	77	S W	...	...	Covered with strati and cirrocumuli.
	16	16	29.888	89	78	59	E S E	...	...	Scattered cumuli.
	17th	10	30.049	83	77	75	E by S	...	...	Cumuli to S. E.
	16	16	29.879	92	77	48	S S E	...	...	Scattered cumuli.
	16th	10	30.029	80	69	51	N	...	0.16	Clear.
	16	16	29.899	88	71	40	N by W	...	...	Scattered cirrostrati.
	10th	10	29.979	80	69	54	S	...	...	Clear.
	16	16	29.805	89	70	35	W N W	...	...	Ditto.
SAUGOR ISLAND.	22th	10	29.971	84	74	60	S S W	...	...	Cirri.
	16	16	29.846	90	73	41	S S W	...	...	Scattered cumuli.
	21st	10	29.981	84	74	60	W S W	...	...	Scattered cirri.
	16	16	29.845	94	73	33	W	...	...	Ditto cirri and cumuli.
	15th	9-30	29.849	82	78	82	S W	Moderate	...	Cloudless.
	16	16	29.743	84	79	79	S W	Moderate	...	Ditto.
	16th	9-30	29.899	81	77	82	S W	Light	...	Scattered clouds.
	16	16	29.852	84	79	79	S W	Light	...	A few clouds towards N. E.
	17th	9-30	29.978	82	80	91	N	Light	...	A few scattered clouds.
	16	16	29.872	83	78	78	S W	Moderate	...	Slightly cloudy.
CHITTAGONG.	18th	9-30	29.947	80	69	54	N	Light	...	Scattered clouds in S. horizon.
	16	16	29.842	88	75	52	N	Light	...	Scattered clouds.
	19th	9-30	29.887	80	75	82	N	...	...	A few clouds towards S. E.
	16	16	29.795	82	75	70	S W	...	...	Clear.
	20th	9-30	29.969	82	77	78	N	...	...	Ditto.
	16	16	29.812	83	78	78	S	Light	...	Cloudless.
	21st	9-30	29.967	82	79	87	N	Light	...	Clear.
	16	16	29.871	84	79	79	N	Light	...	Ditto.
	15th	9-30	29.868	74	71	85	E by S	Light	...	Hazy.
	16	16	29.763	79	74	77	S	Light	...	Ditto.
ARAB.	16th	9-30	29.893	75	69	73	N by W	Light	...	Cumulo strati toward N. and N. W.
	16	16	29.810	80	75	78	S W by W	Light	...	Hazy.
	17th	9-30	29.957	75	74	81	N	Light	...	Ditto.
	16	16	29.810	81	75	74	W by S	Light	...	Cirri to strati.
	18th	9-30	29.908	78	69	61	N	Moderate	...	Misty horizon.
	16	16	29.750	81	73	66	S W by W	Light	...	Ditto. Cirri to cumuli.
	19th	9-30	29.833	77	69	64	N	Light	...	Clear horizon, cirrostrati.
	16	16	29.705	83	71	52	S W by W	Light	...	Misty horizon.
	20th	9-30	29.858	79	72	69	S W	Light	...	Ditto.
	16	16	29.765	83	73	60	S W by W	Light	...	Unsteady wind, cirri to strati.
CUTTACK.	21st	9-30	29.878	79	73	73	N	Light	...	a few cumuli towards W. hazy.
	16	16	29.782	84	76	64	W S W	Light	...	Cirriti, cumuli.
	15th	9-30	29.963	76	71	77	E	Light	...	
	16	16	29.849	84	71	81	W	Light	...	
	16th	9-30	29.990	77	72	77	E	Light	...	
	16	16	29.879	85	78	71	W	Light	...	
	17th	9-30	30.000	77	75	90	E	Light	...	
	16	16	29.842	84	78	75	W	Light	...	
	18th	9-30	29.980	77	75	90	N E	Light	...	
	16	16	29.824	83	78	78	W	Light	...	
MADRAS.	19th	9-30	29.838	78	75	86	N W	Light	...	
	16	16	29.799	85	78	71	W S W	Light	...	
	20th	9-30	29.945	79	73	73	N E	Light	...	
	16	16	29.849	85	78	71	W	Light	...	
	21st	9-30	29.912	80	72	66	N W	Light	...	
	16	16	29.846	86	79	72	W	Moderate.	...	
	15th	9-30	29.966	82	70	52	S by W	...	...	Scattered cirri and hazy.
	16	16	29.848	83	71	40	S S W	...	...	Distant thunder in W. cirri & strati, threatening appearance to S. W.
	16th	9-30	29.993	82	70	52	W	...	...	Calm and hazy, clear sky.
	16	16	29.900	87	76	58	E by S	...	...	Cirri, cirrostrati and misty unsteady wind.
MADRAS.	17th	9-30	30.060	83	73	60	S by W	...	...	Clear.
	16	16	29.946	87	68	33	S by E	...	...	Sultry and slightly hazy, unsteady wind.
	18th	9-30	30.081	80	67	47	E	...	...	Scattered cirri to N. N. W. and fine.
	16	16	29.925	86	69	38	N E	...	...	Cirri, and cirrostrati.
	19th	9-30	30.007	81	71	62	S W	...	...	Clear.
	16	16	29.833	88	69	34	W	...	...	Scattered cirri, cirrostrati, sultry and hazy.
	20th	9-30	29.958	83	73	60	W by S	...	...	Cirri, calm and hazy.
	16	16	29.853	87	73	48	S by E	...	...	Cirrocumuli, cirrostrati, cirri and misty.
	21st	9-30	30.099	83	73	60	S W	...	...	Thin cirri, calm and hazy.
	16	16	29.884	89	75	49	S by E	...	...	Cirrocumuli, cirri, and misty horizon.
MADRAS.	15th	10	29.973	83	72	56	S E by S	9*	...	Fine.
	16	16	29.843	83	73	60	S E	12*	...	Ditto.
	16th	10	29.989	83	73	60	S E	7*	...	Fine with light clouds.
	16	16	29.830	84	74	60	S E	11*	...	Clear.
	17th	10	30.027	85	74	57	S E by E	10*	...	Nearly cloudy.
	16	16	29.893	85	75	60	S E by E	11*	...	Fine, with light clouds.
	18th	10	29.902	83	73	60	S E by S	7*	...	Nearly cloudy.
	16	16	29.855	84	74	60	S E by E	16*	...	Clear.
	19th	10	29.904	84	74	60	S E	6*	...	Cloudy.
	16	16	29.891	84	74	60	S E by E	13*	...	Clear.
MADRAS.	20th	10	29.964	83	74	63	E S E	5*	...	Cloudy.
	16	16	29.855	85	74	57	E S E	10*	...	Passing clouds.
	21st	10	29.907	85	73	54	E by S	7*	...	Fine, with light clouds.
	16	16	29.881	84	74	60	E	9*	...	Light clouds.

\* Velocity in miles per hour.



STATIONS.	March.	Hour.	Barometer reduced to 32°.	THERMOMETER.		Humidity Sat. = 100.	WIND.		Rain.	WEATHER.
				Dry.	Wet.		Direction.	Velocity.		
			Inches.	⊖	⊖				Inches.	
Dacca.	15th	9-30	29.888	78	76	90	S S W	...	...	Moderate wind. Cloudy.
	16		29.738	82	78	82	E S E	...	...	Ditto ditto.
	16th	9-30	29.937	78	75	86	E S E	...	...	Light wind. Cloudy.
	16		29.840	81	78	86	S S W	...	...	Ditto ditto.
	17th	9-30	29.995	79	77	90	E S E	...	...	Ditto Partially cloudy.
	16		29.837	82	77	78	N	...	...	Ditto ditto.
	18th	9-30	29.965	79	71	65	N	...	...	Ditto Clear.
	16		29.817	82	73	63	N W	...	...	Ditto Partially cloudy.
	19th	9-30	29.888	78	71	69	N N W	...	...	Ditto ditto.
	16		29.740	81	73	69	W N W	...	...	Ditto ditto.
BENARH.	20th	9-30	29.832	80	77	86	S W	...	...	Ditto ditto.
	16		29.778	82	75	70	S W	...	...	Moderate wind. Cloudy.
	21st	9-30	29.919	81	78	86	S S W	...	...	Light wind. Partially cloudy.
	16		29.782	84	79	79	S	...	...	
	15th	10	29.667	...	...	...	N E	...	...	Cumuli.
	16		29.568	...	...	...	W	...	...	
	16th	10	29.720	...	...	...	E	...	...	
	16		29.712	...	...	...	Calm	...	...	Nimbi.
	17th	10	29.888	...	...	...	Calm	...	...	Cumuli, nimbi.
	16		29.799	...	...	...	N W	...	...	Cumuli, strati.
DANDELING.	18th	10	29.831	...	...	...	N	...	...	
	16		29.777	...	...	...	Calm	...	...	
	19th	10	29.732	...	...	...	W	Light	...	Strati.
	16		29.603	...	...	...	E	...	...	
	20th	10	29.727	...	...	...	W	...	...	Cumuli.
	16		29.614	...	...	...	E	...	...	Strati.
	21st	10	29.754	...	...	...	W	...	...	Cirri, strati.
	16		29.604	...	...	...	W	...	...	
	15th	9-30	23.274	54	41	37	S W	Light	...	Clear.
	16		23.206	60	50	44	N W	Light	...	Scattered cumuli.
ROCKEER.	16th	9-30	23.335	54	50	73	W	Moderate	...	Cirrocumuli.
	16		23.271	56	53	80	W	Strong	...	Cumuli round horizon, a strong S. W. wind blowing all day.
	17th	9-30	23.372	56	48	51	W S W	Light	...	Clear sky, delightful morning.
	16		23.303	59	52	59	S W	Light	...	Rather misty.
	18th	9-30	23.350	51	48	79	S E	Light	...	Cirrocumuli, a few drops of rain this morning.
	16		23.249	50	47	78	W	Light	...	Rather misty.
	19th	9-30	23.240	53	46	54	E	Light	...	Clear, agreeable morning.
	16		23.167	63	50	18	W	Light	...	Cumuli round horizon, rest clear.
	20th	9-30	23.303	55	50	68	S E	Light	...	Scattered cumuli, pleasant morning.
	16		23.234	53	49	73	W	Light	...	Rather misty.
FAIR POINT.	21st	9-30	23.333	55	51	74	E	Light	...	Clear pleasant morning.
	16		23.276	59	52	69	N W	Light	...	Clear.
	15th	9-30	29.075	69	60	56	Calm	...	0.16	Cirri.
	16		29.005	76	60	34	W	...	...	Cirri overhead, strati in N. W.
	16th	9-30	29.148	75	60	36	Calm	...	...	
	16		29.093	80	60	24	Calm	...	...	Bright clear day.
	17th	9-30	29.132	76	61	37	N E	...	...	
	16		29.035	84	65	31	Calm	...	...	Bright morning, sky clouding over at 15 hour.
	18th	9-30	29.086	77	64	45	S	...	...	Cirri in morning, sky overcast with all kinds of clouds at 12 hours.
	16		28.981	83	63	27	Calm	...	...	Rain clouds, nimbi but no rain fell.
FAIR POINT.	19th	9-30	29.032	78	62	35	S	...	...	Cloudy morning at 12 hour, nimbi morning, down from N. heavy rain at 14 hour, again at 15-30 with thunder and lightning followed by high N. E. wind, dying down to a calm at 20 hours, heavy rain again at 21-30 with high boisterous wind till 1 hour of the 22nd.
	20th	9-30	28.925	83	61	21	S W	...	...	
	16		29.032	77	63	41	N E	...	...	
	16		28.948	85	64	26	S E	...	...	
	21st	9-30	29.071	79	65	43	S	...	...	
	16		29.057	70	63	65	N E	...	...	
	8th	9-30	29.866	75	65	55	N E	...	...	Fresh breezes and fine.
	16		29.771	77	68	60	N E	...	...	Moderate breezes and fine.
	9th	9-30	29.920	77	73	81	E by S	...	...	Light weather.
	16		29.825	79	75	82	S S E	...	...	Ditto.
FAIR POINT.	10th	9-30	29.905	79	75	82	S W	...	...	Strong breeze.
	16		29.859	70	68	89	N N W	...	...	Overcast, a N. W. squall with rain & thunder & lightning.
	11th	9-30	29.917	78	72	69	N E	...	...	Moderate breeze.
	16		29.828	78	72	73	E N E	...	...	Ditto weather and fine.
	12th	9-30	30.013	76	71	77	E	...	...	Light weather and fine.
	16		29.888	78	73	77	S E by E	...	...	Ditto ditto.
	13th	9-30	29.967	78	74	81	S W	...	...	Moderate breezes and fine.
	16		29.862	80	75	78	S W	...	...	Strong breezes and fine.
	14th	9-30	29.915	79	76	86	S W	...	...	Ditto ditto.
	16		29.778	82	77	78	S W	...	...	Ditto ditto.

STATION.	March.	Hour.	Barometer reduced to 32°.	THERMOMETER.		Humidity Sat. = 100.	WIND.		Rain.	WEATHER.
				Dry.	Wet.		Direction.	Velocity.		
PATNA.			Inches.	°	°				Inches.	
	13th	9-30	29.693	82	61	23	N W	...	...	} Warmer.
		3-30	29.565	86	63	21	N W	...	...	
	14th	9-30	29.683	88	59	13	S W	...	...	} Clouds gathering.
		3-30	29.545	88	67	28	N E	...	...	
	15th	9-30	29.678	80	63	51	E	...	...	} W. wind all day.
		3-30	29.555	89	72	40	E	...	...	
	16th	9-30	29.806	78	67	53	N	...	...	} Ditto sultry rain yesterday evening.
		3-30	29.617	87	75	55	W N W	...	...	
	17th	9-30	29.871	81	61	25	S	...	...	} Fine day.
		3-30	29.740	77	58	24	W N W	...	...	
	18th	9-30	29.795	77	61	34	S W	...	...	} Clouds hanging about.
		3-30	29.669	82	69	48	S W	...	...	
	19th	9-30	29.697	83	69	48	S W	...	...	
		3-30	29.561	87	65	25	W N W	...	...	

BENGAL SECRETARIAT,  
The 28th March 1868. }

HENRY F. BLANFORD,  
Meteorological Reporter to Govt. of Bengal.